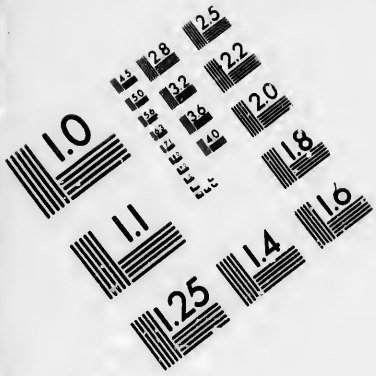

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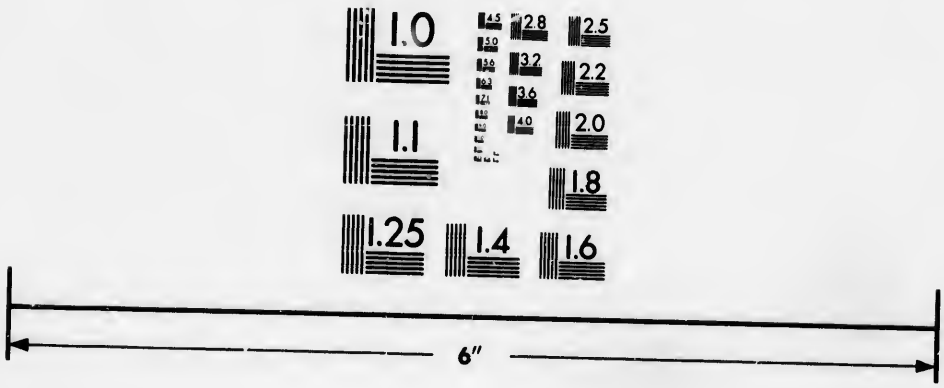

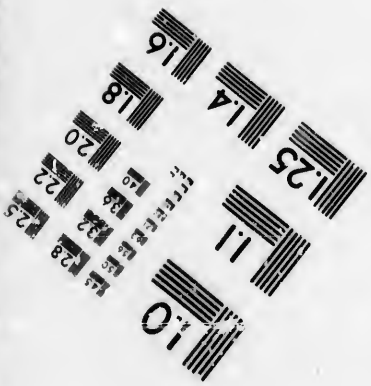

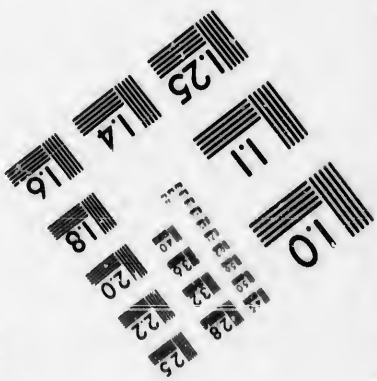

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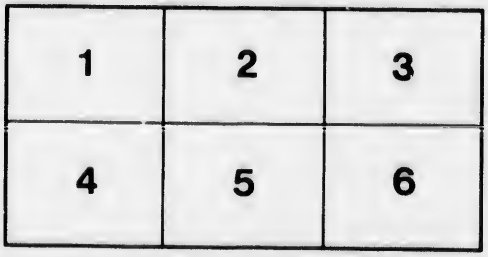

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GRAFTON'S

GRADED ARITHMETIC

BOOK I.

BY

E. W. ARTHY,

SUPERINTENDENT OF CITY SCHOOLS,
MONTREAL.

Authorized for use in the Province of Quebec.

PRICE, 15 CENTS.

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NOTE TO TEACHERS.

The **ten** is the basis of our method of expressing numbers. The selection of the ten as the basis of the system is in all probability to be traced to primitive calculations by means of the ten fingers. Nature has given to man the decimal system of number in the hand. Since this is so, it behoves us to follow nature in our teaching. From the time that we first reach the *ten* to the time that we reach the *hundred* (a full year's most important work), the ten ought to be made the basis of all our instruction in number. A child's real grasp of number is feeble. His *understanding* is *weak*, but his memory is strong. Badly taught children have been known to count very glibly even to 100, without being able to select a dozen counters from a collection; and to make considerable progress in the mechanical processes of addition, subtraction, multiplication and division, without understanding where these operations came from, what they were for or where they were leading. *The method of instruction through the ten assists the child's understanding.*

Teachers are recommended to adopt this method, a full explanation of which will be found in the **Teachers' Manual** that accompanies this book. This Manual, giving detailed directions in using this book, as well as **Answers**, may be procured from the Publishers. Price, 35 cents.

Suggestions or corrections will be gratefully received either by the Author or the Publishers.

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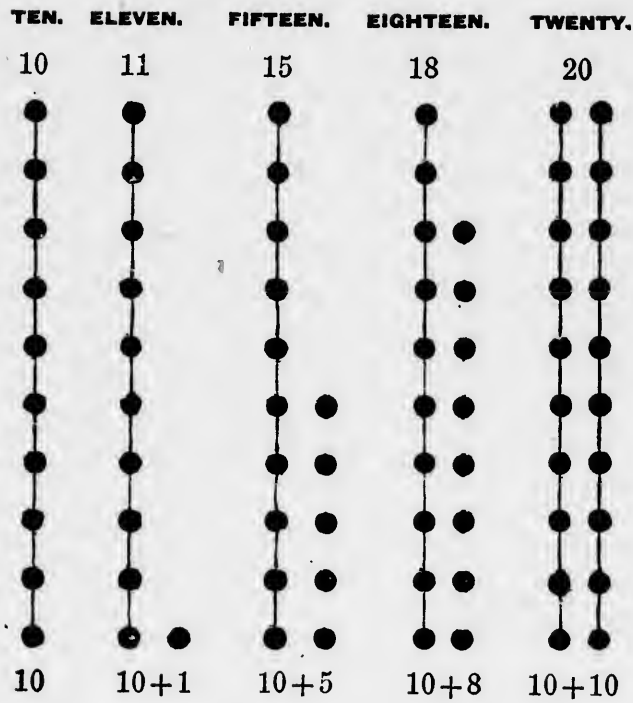
NUMBERS 10 TO 20.



I.

NUMBERS FROM 10 TO 20.

1. Write *ten* in figures; thus, 10.

2. When two figures are written side by side, what does the right-hand figure denote? **Ans.** *Units* or *ones.*

3. What does the figure in the *second place* denote? **Ans.** *Tens.*

4. In 10 what does the 1 denote? **Ans.** *1 ten.*

5. What does the *nought* or *cipher* denote? **Ans.** That there are *no* units or ones.

6. Write and explain the numbers from *ten* to *twenty.*

Eleven	(1 *ten* and *one*)	11
Twelve	(1 *ten* and 2 *ones*)	12
Thirteen	(1 *ten* and 3 *ones*)	13
Fourteen	(1 *ten* and 4 *ones*)	14
Fifteen	(1 *ten* and 5 *ones*)	15
Sixteen	(1 *ten* and 6 *ones*)	16
Seventeen	(1 *ten* and 7 *ones*)	17
Eighteen	(1 *ten* and 8 *ones*)	18
Nineteen	(1 *ten* and 9 *ones*)	19
Twenty	(2 *tens* and 0 *ones*)	20

7. Count from 10 to 20; back from 20 to 10.

8. Show by dots and figures *fourteen, nineteen, seventeen, sixteen.*

9. Copy, read and show by dots 13, 18, 15, 11, 12, 20.

10. Tell what each figure stands for in above example.

A

10 + 1 =	9 + 1 =	9 + 1 + 1 =	9 + ? = 10
10 + 2 =	8 + 2 =	8 + 2 + 2 =	8 + ? = 10
10 + 3 =	7 + 3 =	7 + 3 + 3 =	7 + ? = 10
10 + 4 =	6 + 4 =	6 + 4 + 4 =	6 + ? = 10
10 + 5 =	5 + 5 =	5 + 5 + 5 =	5 + ? = 10
10 + 6 =	4 + 6 =	4 + 6 + 6 =	4 + ? = 10
10 + 7 =	3 + 7 =	3 + 7 + 7 =	3 + ? = 10
10 + 8 =	2 + 8 =	2 + 8 + 8 =	2 + ? = 10
10 + 9 =	1 + 9 =	1 + 9 + 9 =	1 + ? = 10
10 +10 =	10 +10 =	4 + 6 +10 =	10 + ? = 10

B

2	3	4	5	6	7	8	9	3	4
9	8	7	6	5	4	3	2	9	8
—	—	—	—	—	—	—	—	—	—
5	6	4	5	6	5	6	7	7	3
7	6	9	8	7	9	8	6	9	9
—	—	—	—	—	—	—	—	—	—
8	3	9	9	7	8	9	0	0	1
7	8	3	7	7	8	9	7	6	8
—	—	—	—	—	—	—	—	—	—
7	6	8	9	5	10	7	6	9	9
..	..	..	..	..	..	..	..	..	..
—	—	—	—	—	—	—	—	—	—
17	16	10	10	15	12	10	16	11	12

C

1. What number with 5 makes 10?
   What number with 10 makes 16?
   What number with 7 makes 17?
   What number with 10 makes 12?
   What number with 8 makes 11?

2. 4 and how many make 14?
9 and how many make 11?
6 and how many make 10?
6 and how many make 13?
4 and how many make 10?
4 and how many make 13?
8 and how many make 10?
8 and how many make 13?
8 and how many make 15?

3.

9 + 2 =	11 − ? = 9	11 − 2 =	11 − 9 =
8 + 3 =	11 − ? = 8	11 − 3 =	11 − 8 =
7 + 5 =	12 − ? = 7	12 − 5 =	12 − 7 =
8 + 7 =	15 − ? = 8	15 − 8 =	15 − 7 =
10 + 9 =	19 − ? = 10	19 − 9 =	19 − 10 =

4. Copy, and write under each the number that must be added to the lower number to make the upper number:—

9	12	15	15	13	16	11	11	11
3	4	5	6	7	8	9	2	5
—	—	—	—	—	—	—	—	—
10	18	17	17	17	15	15	14	16
3	9	8	9	10	8	9	0	9
—	—	—	—	—	—	—	—	—

5. Copy and add:—

3	4	2	2	5	2	3	1	6
1	2	5	4	3	4	5	2	4
2	3	2	3	1	1	0	5	0
3	5	4	2	2	5	3	4	7
—	—	—	—	—	—	—	—	—
8	8	6	1	8	6	8	7	1
1	1	5	7	1	2	0	9	2
7	6	1	6	3	1	2	3	8
2	4	8	5	5	9	9	0	9
—	—	—	—	—	—	—	—	—

6. Add and put in the number required to make 20, wherever the .. is:—

6	5	3	7	2	5	1	3	2
4	3	9	3	7	0	6	4	8
2	4	2	4	1	4	4	4	3
3	2	4	2	7	2	0	2	1
..	..	..	..	..	..	..	..	..
20	20	20	20	20	20	20	20	20

7. Read the following:—

8 + 9 = 17	11 + 5 = 16	11 − 2 = 9
4 + 7 = 11	17 − 9 = 8	17 − 13 = 4
9 − 4 = 5	19 − 8 = 11	15 + 4 = 19

8. Read and fill in:—

15 − 3 =	7 + 8 =	16 − 7 =	11 + 5 =
16 − 5 =	3 + 12 =	13 − 8 =	12 + 7 =
19 − 2 =	2 + 13 =	19 − 13 =	11 + 8 =
14 − 8 =	4 + 11 =	17 − 11 =	13 + 7 =
20 − 13 =	7 + 12 =	14 − 11 =	11 + 9 =
19 − 7 =	8 + 12 =	20 − 5 =	12 + 8 =

D

1. Add by *twos* to 20, beginning 0, 2, 4.
2. Add by *twos* to 19, beginning 1, 3, 5.
3. Subtract by *twos* from 20.
4. Subtract by *twos* from 19.
5. Add by *threes* to 18, starting from 0.
6. Add by *threes* to 19, starting from 1.
7. Add by *threes* to 20, starting from 2.
8. Subtract by *threes* from 18.
9. Subtract by *threes* from 19.
10. Subtract by *threes* from 20.

make 20,

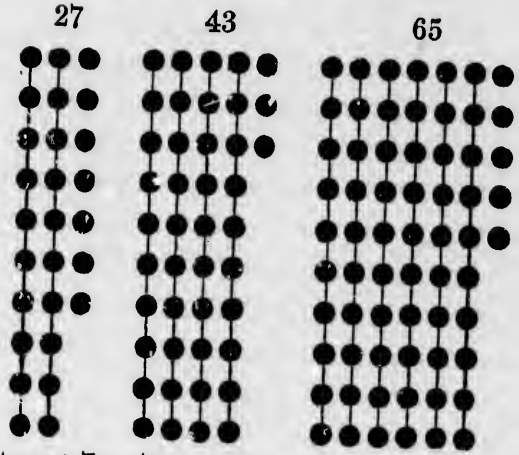
3 2
4 8
4 3
2 1
.. —
) 20

2 = 9
3 = 4
4 = 19

+ 5 =
+ 7 =
+ 8 =
+ 7 =
+ 9 =
+ 8 =

II.

NUMBERS 20 TO 100.



2 tens + 7. 4 tens + 3. 6 tens + 5.

Twenty	(2 *tens* and *no units*)	20
Twenty-one	(2 *tens* and *one*)	21
Twenty-two	(2 *tens* and 2 *units*)	22
Twenty-three	(2 *tens* and 3 *units*)	23
Twenty-four	(2 *tens* and 4 *units*)	24
Twenty-five	(2 *tens* and 5 *units*)	25
Twenty-six	(2 *tens* and 6 *units*)	26
Twenty-seven	(2 *tens* and 7 *units*)	27
Twenty-eight	(2 *tens* and 8 *units*)	28
Twenty-nine	(2 *tens* and 9 *units*)	29
Thirty	(3 *tens* and 0 *units*)	30
Thirty-one	(3 *tens* and *one*)	31
Forty	(4 *tens*)	40
Fifty	(5 *tens*)	50
Sixty	(6 *tens*)	60
Seventy	(7 *tens*)	70
Eighty	(8 *tens*)	80
Ninety	(9 *tens*)	90
One hundred	(10 *tens*)	100

A

1. Draw dots and write figures to show :—

2 tens and 3 units;	5 tens and 8 units.
9 tens and 5 units;	4 tens and 0 units.
3 tens and one;	7 tens and 2 units.
1 ten and 7 units;	6 tens and 4 units.

2. How many tens and units are there in 24, 33, 49, 56, 11, 85, 60, 78, 91, 20, 14, 92?

3. Name the following numbers, and tell of what each consists :—30, 49, 17, 26, 58, 95, 81, 73, 34, 42, 12, 21, 55, 97, 89, 70.

4. Write in figures :—

fifty-four;	*ninety-seven;*	*thirty-five;*
eighty-six;	*forty;*	*seventeen;*
sixty-one;	*twenty-seven;*	*seventy-two;*
fifty-five;	*eighty-four;*	*forty-nine.*

5. Count

from 20 to 30;	from 30 back to 20.
from 50 to 60;	from 60 back to 50.
from 90 to 100;	from 100 back to 90.
from 32 to 39;	from 39 back to 32.
from 71 to 78;	from 78 back to 71.
from 45 to 53;	from 53 back to 45.
from 57 to 64;	from 64 back to 57.
from 83 to 96;	from 96 back to 83.

6. How many more is

26 than 2 tens?	63 than 6 tens?
59 than 5 tens?	38 than 3 tens?
88 than 8 tens?	47 than 4 tens?

7. How many more is

23 than 20?	37 than 30?
52 than 50?	79 than 70?
44 than 40?	96 than 90?

8. How many tens are required to raise

20 to 30?	60 to 80?	50 to 70?
30 to 40?	20 to 70?	70 to 90?
20 to 40?	30 to 90?	10 to 100?

9. How many *units* are required to raise

28 to 30?	35 to 40?	49 to 50?
81 to 90?	62 to 70?	72 to 80?
53 to 60?	96 to 100?	21 to 30?
34 to 40?	53 to 60?	88 to 90?

10. How many does each of the following numbers need to raise it to the *next ten* above:—

29; 24; 26; 32; 47; 55; 58; 67?
63; 76; 71; 87; 92; 99; 13; 17?

11. In 87 there are 8 tens and 7 units left over; 3 units more are required to make 9 tens. Tell the same about 46, 38, 72, 99, 61, 68, 23, 19.

B

1. Copy and add by *tens*:—

30	50	20	30	40	50	70	20
40	20	30	30	40	40	20	40
—	—	—	—	—	—	—	—
40	30	20	50	50	80	70	90
30	60	70	50	30	20	30	10
—	—	—	—	—	—	—	—
50	40	30	80	70	90	80	80
60	70	90	60	50	90	70	90
—	—	—	—	—	—	—	—

(*Answers to be written in tens.*)

2.

(*a*)	1 ten + 7 tens =	10 + 70 =	70 − 10 =
(*b*)	6 tens + 2 tens =	60 + 20 =	60 − 20 =
(*c*)	3 tens + 4 tens =	30 + 40 =	40 − 30 =
(*d*)	8 tens − 6 tens =	80 − 60 =	80 + 60 =
(*e*)	9 tens − 5 tens =	90 − 50 =	90 + 50 =
(*f*)	7 tens + 3 tens =	70 + 30 =	70 − 30 =
(*g*)	10 tens − 5 tens =	100 − 50 =	100 + 50 =
(*h*)	10 tens − 9 tens =	100 − 90 =	100 + 90 =

3.

A	B	C	D
30+10+6 =	30+16 =	30+26 =	30+36 =
40+20+5 =	40+25 =	40+35 =	40+45 =
20+10+7 =	20+17 =	20+27 =	20+67 =
70+20+9 =	70+29 =	70+ 9 =	70+19 =
70−20+9 =	79−20 =	79+20 =	89−20 =
50−30+8 =	58−30 =	58+30 =	88−30 =
60−50+2 =	62−50 =	62+50 =	62−60 =
100−40+3 =	103−40 =	103+40 =	103−20 =

4.

A	B	C	D
17+10 =	28+20 =	49+30 =	96−70 =
17−10 =	28−20 =	72+60 =	86−70 =
57+10 =	31+30 =	93+30 =	68−20 =
57−10 =	31−30 =	76+50 =	41−30 =
84+10 =	65+40 =	30+49 =	47−40 =
84−10 =	65−40 =	50+46 =	88−70 =
16+10 =	96+50 =	50+89 =	99−80 =
16−10 =	96−50 =	80+94 =	93−40 =

5. A *one* is sometimes called a *unit*.
Thus, 5 stands for 5 ones or 5 units.
How many *units* make 1 *ten*?
How many *units* make 1 hundred?
How many *tens* make 1 hundred?

− 10 =
− 20 =
− 30 =
+ 60 =
+ 50 =
− 30 =
+ 50 =
+ 90 =

D

0+36 =
0+45 =
0+67 =
0+19 =
9−20 =
8−30 =
2−60 =
3−20 =

D

6−70 =
6−70 =
8−20 =
1−30 =
7−40 =
8−70 =
9−80 =
3−40 =

III.

DIGITS AND DECADES.

1	2	3	4	5	6	7	8	9
19	18	17	16	15	14	13	12	11
29	28	27	26	25	24	23	22	21
39	38	37	36	35	34	33	32	31
49	48	47	46	45	44	43	42	41
59	58	57	56	55	54	53	52	51
69	68	67	66	65	64	63	62	61
79	78	77	76	75	74	73	72	71
89	88	87	86	85	84	83	82	81
99	98	97	96	95	94	93	92	91

Add 2 to each number in the above columns; also 3, 4, 5, 6, 7, 8, 9, 10.

Take 2 from each number in the above columns; also 3, 4, 5, 6, 7, 8, 9, 10.

(This is an important exercise for mental drill on the *unit figure*. Pupils should not use the table, but teachers should give questions in addition and subtraction after the following models.)

1. How many are 9 and 2? 19 and 2? 29 and 2? 39 and 2? 49 and 2? 59 and 2? 69 and 2? 79 and 2? 89 and 2? 99 and 2?

2. How many does 2 need to make 9? 19? 29? 39? 49? 59? 69? 79? 89? 99?

3. How many are 9 less 2? 19 less 2? 29 less 2? 39 less 2? 49 less 2? 59 less 2? 69 less 2? 79 less 2? 89 less 2? 99 less 2?

1	2	3	4
9 + 2 =	2 + 9 =	11 − 2 =	86 − 2 =
19 + 2 =	22 + 9 =	31 − 2 =	45 − 2 =
59 + 2 =	62 + 9 =	71 − 2 =	69 − 2 =
89 + 2 =	72 + 9 =	51 − 2 =	28 − 2 =
8 + 2 =	2 + 8 =	12 − 2 =	53 − 2 =
38 + 2 =	12 + 8 =	40 − 2 =	24 − 2 =
78 + 2 =	82 + 8 =	60 − 2 =	97 − 2 =
98 + 2 =	92 + 8 =	90 − 2 =	100 − 2 =

5. Add by *twos* from 20 to 40: from 70 to 90.
6. Subtract by *twos* from 50 to 30; from 100 to 80.
7. Add by *twos* from 21 to 41; from 65 to 85.
8. Subtract by *twos* from 99 to 79; from 19 to 1.
9. 17+2+2+2+1.
10. 6+2−1+2−1.
11. 19−2−2−2−2.
12. 30−2+1−2+1.

1	2	3	4
8 + 3 =	3 + 8 =	11 − 3 =	23 − 3 =
18 + 3 =	23 + 8 =	81 − 3 =	94 − 3 =
78 + 3 =	63 + 8 =	62 − 3 =	35 − 3 =
19 + 3 =	13 + 9 =	22 − 3 =	49 − 3 =
49 + 3 =	43 + 9 =	52 − 3 =	77 − 3 =
89 + 3 =	73 + 9 =	72 − 3 =	56 − 3 =
17 + 3 =	33 + 7 =	90 − 3 =	88 − 3 =
57 + 3 =	53 + 7 =	100 − 3 =	20 − 3 =

5. Add by *threes* from 20 to 50; from 19 to 49; from 18 to 48.
6. Subtract by *threes* from 50 to 20; from 49 to 19; from 48 to 18.
7. 2+3+1+3+2+3.
8. 3+1−2+3−1+3.
9. 49+3+2+3+1+2.
10. 40−2−3−2−1−3.
11. 25−3+2−3+2−1.
12. 19−2−3+1+0−3.

1	2	3	4
6 + 4 =	94 + 0 =	30 − 4 =	18 − 4 =
56 + 4 =	44 + 4 =	41 − 4 =	98 − 4 =
17 + 4 =	54 + 3 =	69 − 4 =	17 − 4 =
37 + 4 =	74 + 4 =	55 − 4 =	20 − 4 =
28 + 4 =	14 + 3 =	100 − 4 =	93 − 4 =
48 + 4 =	14 + 1 =	32 − 4 =	23 − 4 =
9 + 4 =	74 + 7 =	26 − 4 =	81 − 4 =
69 + 4 =	94 + 6 =	13 − 4 =	11 − 4 =
79 + 4 =	94 + 9 =	24 − 4 =	9 − 4 =

5. Add by *fours* from 0 to 32; from 1 to 33; from 2 to 34; from 3 to 35.

6. Subtract by *fours* from 20 to 0; from 21 to 1; from 22 to 2; from 23 to 3.

7. 2+3+4+3+2+4.
8. 50−3+4−2+3−4.
9. 17−4−4−3−4−2.
10. 100−4+3−4+1−4.

1	2	3	4
6 + 5 =	11 + 5 =	11 − 5 =	17 − 5 =
46 + 5 =	75 + 5 =	71 − 5 =	23 − 5 =
17 + 5 =	23 + 5 =	28 − 5 =	83 − 5 =
37 + 5 =	12 + 5 =	68 − 5 =	56 − 5 =
28 + 5 =	92 + 5 =	12 − 5 =	16 − 5 =
58 + 5 =	84 + 5 =	22 − 5 =	15 − 5 =
19 + 5 =	98 + 5 =	92 − 5 =	35 − 5 =
69 + 5 =	15 + 5 =	49 − 5 =	55 − 5 =
89 + 5 =	75 + 5 =	67 − 5 =	100 − 5 =

5. Add by *fives* from 0 to 50; from 1 to 26; from 2 to 27; from 3 to 28; from 4 to 29.

6. Subtract by *fives* from 50 to 0; from 26 to 1.

7. 4+3+5+2+5+4.
8. 11+5−4−3+2−1.
9. 23−5−5−4−4−4.
10. 72+5−4+3−2−5.

1	2	3	4
15 + 6 =	19 + 6 =	11 − 6 =	22 − 6 =
55 + 6 =	69 + 6 =	31 − 6 =	72 − 6 =
27 + 6 =	66 + 9 =	21 − 6 =	50 − 6 =
47 + 6 =	36 + 5 =	43 − 6 =	90 − 6 =
18 + 6 =	56 + 7 =	83 − 6 =	89 − 6 =
88 + 6 =	66 + 8 =	13 − 6 =	17 − 6 =
46 + 6 =	96 + 9 =	84 − 6 =	36 − 6 =
76 + 6 =	53 + 6 =	45 − 6 =	65 − 6 =
77 + 6 =	24 + 6 =	15 − 6 =	100 − 6 =

5. Take 6 from 23, 27, 56, 49, 82, 71, 58, 93.
6. 6+6+6+6+6.
7. 5+6+3+2+6.
8. 6+1+5+0+6.
9. 7−4+2+6−3.
10. 6+4+5−6−6−3.
11. 73−6+5+3−4−0.
12. 58+3−5−6+4−1.
13. 41−5−4−6+3+5.

1	2	3	4
4 + 7 =	16 + 7 =	21 − 7 =	14 − 7 =
34 + 7 =	56 + 7 =	31 − 7 =	64 − 7 =
74 + 7 =	76 + 7 =	91 − 7 =	84 − 7 =
35 + 7 =	58 + 7 =	12 − 7 =	65 − 7 =
85 + 7 =	59 + 7 =	72 − 7 =	85 − 7 =
17 + 7 =	88 + 7 =	83 − 7 =	38 − 7 =
57 + 7 =	98 + 7 =	93 − 7 =	49 − 7 =
67 + 7 =	99 + 7 =	13 − 7 =	67 − 7 =
13 + 7 =	73 + 7 =	50 − 7 =	100 − 7 =

5. Add 7 to 23, 26, 28, 49, 37, 59, 73, 88.
6. Take 7 from 28, 46, 37, 88, 64, 62, 71, 43.
7. 4+7+5+6+7+2.
8. 6+7+4+3+1+5.
9. 5+7−6−5+4+7.
10. 7+7+7−6−6−6.
11. 51+3+7−4+6−5.
12. 14+3−7+2−6+5.
13. 34+7+7+7+7+7.
14. 40−7−7−7−7−7.

1	2	3	4
17 + 8 =	52 + 8 =	35 − 8 =	11 − 8 =
37 + 8 =	12 + 8 =	55 − 8 =	61 − 8 =
3 + 8 =	33 + 8 =	26 − 8 =	92 − 8 =
83 + 8 =	43 + 8 =	76 − 8 =	22 − 8 =
25 + 8 =	64 + 8 =	87 − 8 =	33 − 8 =
75 + 8 =	84 + 8 =	37 − 8 =	13 − 8 =
9 + 8 =	36 + 8 =	28 − 8 =	24 − 8 =
19 + 8 =	66 + 8 =	59 − 8 =	54 − 8 =
99 + 8 =	28 + 8 =	50 − 8 =	100 − 8 =

5. Count by *eights* from 0 to 40; from 3 to 43.
6. Take 8 from 51, 60, 63, 56, 32, 24, 89.
7. 2+4+1+5+3+3+4+2+5+2+1+4.
8. 4+5−3+7−6+4−5+8−6−2.

1	2	3	4
22 + 9 =	6 + 9 =	11 − 9 =	15 − 9 =
82 + 9 =	46 + 9 =	41 − 9 =	25 − 9 =
13 + 9 =	87 + 9 =	82 − 9 =	46 − 9 =
53 + 9 =	17 + 9 =	22 − 9 =	76 − 9 =
4 + 9 =	38 + 9 =	33 − 9 =	87 − 9 =
74 + 9 =	88 + 9 =	83 − 9 =	17 − 9 =
35 + 9 =	19 + 9 =	54 − 9 =	48 − 9 =
45 + 9 =	99 + 9 =	64 − 9 =	28 − 9 =
11 + 9 =	91 + 9 =	59 − 9 =	100 − 9 =

5. Count by *nines* from 0 to 45; from 2 to 47.
6. Take 9 from 42, 94, 60, 79, 56, 87, 28.
7. 2+9+3+9+8.
8. 5+8−3−9+8.
9. 7+8+9+7+9.
10. 9+8+7−6−7.
11. 40−9−9−9−9.
12. 8+7+2+5+9+9.
13. 25+9−7+3−8−8.
14. 7+9+8−6+5−8.
15. 91+9−8+7−6+5.
16. 19+5−7+3−8+9.

IV.

A

Add:—

	A	B	C	D	E	F	G	H	I	J
1.	3	1	3	9	8	9	7	4	9	6
	2	0	2	6	7	7	5	6	8	7
	5	8	7	8	6	6	7	7	8	4
2.	5	6	7	3	9	3	7	5	7	4
	3	8	9	7	7	7	9	8	3	8
	7	4	4	5	2	4	6	6	5	6
	4	5	8	9	8	6	3	8	8	7
3.	1	8	9	8	8	6	5	9	9	9
	6	9	0	5	5	8	8	5	3	8
	7	2	4	1	1	5	3	9	8	9
	8	6	7	6	9	3	7	6	9	8
	9	9	5	5	7	7	9	8	8	9
4.	6	9	6	6	6	6	9	9	9	6
	5	6	7	4	8	9	8	7	9	5
	7	4	9	7	5	8	8	8	8	7
	8	7	7	2	3	2	6	6	9	7
	8	7	7	8	8	9	6	8	6	8
	9	8	8	9	8	7	7	9	7	9

B

1. 4 cents, 6 cents, 3 cents, 7 cents. How many?
2. 3 marbles, 7 marbles, 6 marbles, 5 marbles?
3. 7 counters, 5 counters, 3 counters, 8 counters?
4. 8 dots, 7 dots, 3 dots, 4 dots, 5 dots?

I	J
9	6
8	7
8	4
—	—
7	4
3	8
5	6
8	7
—	—
9	9
3	8
8	9
9	8
8	9
—	—
9	6
9	5
8	7
9	7
6	8
7	9
—	—

ow many?
arbles?
counters?

5. 6 books, 7 books, 9 books, 2 books?
6. 9 apples, 6 apples, 6 apples, 9 apples?
7. 8 boys, 7 boys, 7 boys, 6 boys, 5 boys?
8. 3 girls, 9 girls, 8 girls, 6 girls, 7 girls?
9. 3 tens, 9 tens, 8 tens, 6 tens, 7 tens?
10. 8 units, 8 units, 7 units, 9 units?

1. I have 11 cents and spend 3. What left?
2. John has 18 marbles and loses 5?
3. There are 30 cakes, and Mary eats 3?
4. Arthur makes 23 marks on his slate and rubs out 6?
5. 24 apples; 10 are eaten; how many left?
6. A twenty-gallon can has 7 gallons of milk in it. How many gallons does it require to fill it?
7. John is 40 and Mary is 34. How much older is John?
8. A child is 13. What age was he 6 years ago?
9. There were 43 chickens, but a fox killed 5?
10. There are 50 roses on a rosebush, and I pick 8?

Tell all you can find out in the following examples by adding or subtracting:—

1. A pineapple cost 15 cents and an orange 5 cents.
2. There are 8 boys and 11 girls in the class.
3. Willie had 25 cents and spent all but 15 cents.
4. Mary is 18 years old and George 12 years.
5. Charlie has 9 examples right and 7 wrong.
6. George caught 7 fish on Monday and 15 on Tuesday.
7. Alice slept 9 hours last night and 8 the night before.
8. Martha has 11 white beads and 7 black ones.
9. One cow gives 13 quarts of milk and another 9.
10. Clara has 6 books at school and 17 books at home.

V.

MULTIPLICATION AND DIVISION TABLES.

TWOS.

Multiplication		*Division.*	
$2 \times 1 = 2$	$2 \times 6 = 12$	$2 \div 2 = 1$	$12 \div 2 = 6$
$2 \times 2 = 4$	$2 \times 7 = 14$	$4 \div 2 = 2$	$14 \div 2 = 7$
$2 \times 3 = 6$	$2 \times 8 = 16$	$6 \div 2 = 3$	$16 \div 2 = 8$
$2 \times 4 = 8$	$2 \times 9 = 18$	$8 \div 2 = 4$	$18 \div 2 = 9$
$2 \times 5 = 10$	$2 \times 10 = 20$	$10 \div 2 = 5$	$20 \div 2 = 10$

THREES.

$3 \times 1 = 3$	$3 \times 6 = 18$	$3 \div 3 = 1$	$18 \div 3 = 6$
$3 \times 2 = 6$	$3 \times 7 = 21$	$6 \div 3 = 2$	$21 \div 3 = 7$
$3 \times 3 = 9$	$3 \times 8 = 24$	$9 \div 3 = 3$	$24 \div 3 = 8$
$3 \times 4 = 12$	$3 \times 9 = 27$	$12 \div 3 = 4$	$27 \div 3 = 9$
$3 \times 5 = 15$	$3 \times 10 = 30$	$15 \div 3 = 5$	$30 \div 3 = 10$

FOURS.

$4 \times 1 = 4$	$4 \times 6 = 24$	$4 \div 4 = 1$	$24 \div 4 = 6$
$4 \times 2 = 8$	$4 \times 7 = 28$	$8 \div 4 = 2$	$28 \div 4 = 7$
$4 \times 3 = 12$	$4 \times 8 = 32$	$12 \div 4 = 3$	$32 \div 4 = 8$
$4 \times 4 = 16$	$4 \times 9 = 36$	$16 \div 4 = 4$	$36 \div 4 = 9$
$4 \times 5 = 20$	$4 \times 10 = 40$	$20 \div 4 = 5$	$40 \div 4 = 10$

FIVES.

$5 \times 1 = 5$	$5 \times 6 = 30$	$5 \div 5 = 1$	$30 \div 5 = 6$
$5 \times 2 = 10$	$5 \times 7 = 35$	$10 \div 5 = 2$	$35 \div 5 = 7$
$5 \times 3 = 15$	$5 \times 8 = 40$	$15 \div 5 = 3$	$40 \div 5 = 8$
$5 \times 4 = 20$	$5 \times 9 = 45$	$20 \div 5 = 4$	$45 \div 5 = 9$
$5 \times 5 = 25$	$5 \times 10 = 50$	$25 \div 5 = 5$	$50 \div 5 = 10$

SIXES.

Multiplication		*Division.*	
6 × 1 = 6	6 × 6 = 36	6 ÷ 6 = 1	36 ÷ 6 = 6
6 × 2 = 12	6 × 7 = 42	12 ÷ 6 = 2	42 ÷ 6 = 7
6 × 3 = 18	6 × 8 = 48	18 ÷ 6 = 3	48 ÷ 6 = 8
6 × 4 = 24	6 × 9 = 54	24 ÷ 6 = 4	54 ÷ 6 = 9
6 × 5 = 30	6 × 10 = 60	30 ÷ 6 = 5	60 ÷ 6 = 10

SEVENS.

7 × 1 = 7	7 × 6 = 42	7 ÷ 7 = 1	42 ÷ 7 = 6
7 × 2 = 14	7 × 7 = 49	14 ÷ 7 = 2	49 ÷ 7 = 7
7 × 3 = 21	7 × 8 = 56	21 ÷ 7 = 3	56 ÷ 7 = 8
7 × 4 = 28	7 × 9 = 63	28 ÷ 7 = 4	63 ÷ 7 = 9
7 × 5 = 35	7 × 10 = 70	35 ÷ 7 = 5	70 ÷ 7 = 10

EIGHTS.

8 × 1 = 8	8 × 6 = 48	8 ÷ 8 = 1	48 ÷ 8 = 6
8 × 2 = 16	8 × 7 = 56	16 ÷ 8 = 2	56 ÷ 8 = 7
8 × 3 = 24	8 × 8 = 64	24 ÷ 8 = 3	64 ÷ 8 = 8
8 × 4 = 32	8 × 9 = 72	32 ÷ 8 = 4	72 ÷ 8 = 9
8 × 5 = 40	8 × 10 = 80	40 ÷ 8 = 5	80 ÷ 8 = 10

NINES.

9 × 1 = 9	9 × 6 = 54	9 ÷ 9 = 1	54 ÷ 9 = 6
9 × 2 = 18	9 × 7 = 63	18 ÷ 9 = 2	63 ÷ 9 = 7
9 × 3 = 27	9 × 8 = 72	27 ÷ 9 = 3	72 ÷ 9 = 8
9 × 4 = 36	9 × 9 = 81	36 ÷ 9 = 4	81 ÷ 9 = 9
9 × 5 = 45	9 × 10 = 90	45 ÷ 9 = 5	90 ÷ 9 = 10

TENS.

10 × 1 = 10	10 × 6 = 60	10 ÷ 10 = 1	60 ÷ 10 = 6
10 × 2 = 20	10 × 7 = 70	20 ÷ 10 = 2	70 ÷ 10 = 7
10 × 3 = 30	10 × 8 = 80	30 ÷ 10 = 3	80 ÷ 10 = 8
10 × 4 = 40	10 × 9 = 90	40 ÷ 10 = 4	90 ÷ 10 = 9
10 × 5 = 50	10 × 10 = 100	50 ÷ 10 = 5	100 ÷ 10 = 10

TWOS.

1. How many *times* 2 is 2+2+2? 2+2+2+2?
2. How many *times* 2 is 2+2+2+2+2+2+2?
3. There are 2 *dots* in each *row*.
   How many dots are there in 2 rows?
   In 3 rows? In 4 rows? In 5 rows?
   In 6 rows? In 7 rows? In 8 rows?
   In 9 rows? In 10 rows?

4.

1 two =	4 twos =	7 twos =
2 twos =	5 twos =	8 twos =
3 twos =	6 twos =	9 twos =

5. Count by *twos* from 0 to 20.
6. Make a multiplication table of 2's from 2×1 to 2×10.
7. In 2 how many *twos*? In 12 how many *twos*?
   In 4 how many *twos*? In 14 how many *twos*?
   In 6 how many *twos*? In 16 how many *twos*?
   In 8 how many *twos*? In 18 how many *twos*?
   In 10 how many *twos*? In 20 how many *twos*?
8. Make a division table of 2's from $2 \div 2$ to $20 \div 2$.
9. When any *number* or *thing*, as an apple, is divided into *two* equal parts, one of these parts is called **one-half** (written $\frac{1}{2}$). How many halves make one?
10. What is one-half of 2? Of 4? Of 8? Of 20?
11. What will 2 oranges cost at 3 cents each?
12. At 2 cents each how many lemons can you buy for 10 cents?
13.

$2 \times 4 =$	$6 \div 2 =$	$\frac{1}{2}$ of $4 =$	$2 \times 2 + 2 =$
$2 \times 7 =$	$10 \div 2 =$	$\frac{1}{2}$ of $14 =$	$2 \times 5 + 6 =$
$2 \times 6 =$	$16 \div 2 =$	$\frac{1}{2}$ of $10 =$	$2 \times 8 - 3 =$
$2 \times 10 =$	$18 \div 2 =$	$\frac{1}{2}$ of $20 =$	$2 \times 9 - 6 =$

THREES.

1. How many dots in each row? In 2 rows? In 5 rows?

2. How many times 3 is 3+3+3? 3+3+3+3+3?

3. How many 3's added together make 6? 12? 18?

4. 2 threes = 5 threes = 8 threes =
   3 threes = 6 threes = 9 threes =
   4 threes = 7 threes = 10 threes =

5. Count by 3's from 0 to 30.

6. Make a multiplication table of *threes* to 3 × 10.

7. In 3 how many threes? In 30 how many threes?
   In 9 how many threes? In 21 how many threes?
   In 15 how many threes? In 27 how many threes?
   In 24 how many threes? In 12 how many threes?

8. Make a division table of threes to 30 ÷ 3.

9. 3 cherries in a bunch. How many in 6 bunches?

10. Cost of 4 peaches at 3 cents each?

11. 3 feet in a yard. How many feet in 7 yards?

12. 3×2=6; 2×3=6. Draw *dots* to show this.

13. Divide 12 nuts among 3 children.

14. How many rows of 3 dots each must you count in order to get 9 dots? 21 dots? 15 dots?

15. When a number or thing, like a strip of paper, is divided into *three* equal parts, one of these parts is called **one-third** (written $\frac{1}{3}$). How many *thirds* make *one*?

16. What is *one-third* of 3? Of 6? Of 24? Of 30?

17.

3×4=	9÷3=	$\frac{1}{3}$ of 12=	3× 6+4=
3×8=	15÷3=	$\frac{1}{3}$ of 24=	3×10+9=
3×7=	27÷3=	$\frac{1}{3}$ of 27=	3× 9−7=
3×2=	3÷3=	$\frac{1}{3}$ of 18=	3× 3+3=

FOURS.

1. Make on your slate *ten* rows of dots with *four* dots in each row.

2. How many of these *rows* must you count in order to get 12 dots? 16 dots? 24 dots? 32 dots?

3. 2 fours = 5 fours = 8 fours =
3 fours = 6 fours = 9 fours =
4 fours = 7 fours = 10 fours =

4. In 8 how many fours? In 20 how many fours?
In 16 how many fours? In 32 how many fours?
In 40 how many fours? In 12 how many fours?
In 36 how many fours? In 28 how many fours?

5. Count by 4's from 0 to 40.

6. Make a multiplication table to 4×10.

7. Make a division table to $40 \div 4$.

8. When a number or thing, as a circle, is divided into *four* equal parts, each one of these parts is called **one-fourth** or **one-quarter** (written $\frac{1}{4}$). How many *fourths* or *quarters* make one? (Show by drawing.)

9. What is one-fourth of 8? 20? 36? 28?

10. Multiply 2, 7, 5, 6, 4, 8, 3, 10, 9, each by 4.

11. Divide 8, 32, 28, 40, 24, 16, 36, each by 4.

12. What is $\frac{1}{4}$ of 4? Of 12? Of 20?

13. 6 rows of trees, 4 trees in each row. How many?

14. 4 gills make a pint. How many gills in 7 pints?

15. Draw 12 dots in 4 rows. How many in each row?

16. 16 ounces in a pound. How many ounces in $\frac{1}{4}$ of a pound?

17. 20 bushels of potatoes at $\frac{1}{4}$ of a dollar for each bushel?

18. A pail holds 4 gallons. How many pailfuls in 24 gallons?

FIVES.

1. Make on your slate *ten* rows of dots with *five* dots in each row.

2. How many of these rows must you count in order to get 10 dots? 20 dots? 25 dots? 35 dots? 50 dots?

3. How many dots are there in 2 rows? In 3 rows? In 7 rows? In 8 rows? In 5 rows?

4.

2 fives =	5 fives =	8 fives =
3 fives =	6 fives =	9 fives =
4 fives =	7 fives =	10 fives =

5. In 10 how many fives? In 35 how many fives?
In 15 how many fives? In 40 how many fives?
In 30 how many fives? In 50 how many fives?

6. How many *fives* make *one ten*? *Two tens*? 3 tens? 4 tens? 5 tens?

7. Add by fives from 0 to 50.

8. Subtract by fives from 50 to 0.

9. Make a multiplication table to 5×10.

10. Make a division table to $50 \div 5$.

11. Make dots to show that $5 \times 4 = 4 \times 5$.

12. Make dots to show that 10 fives are the same as 5 tens.

13.

$6 \times 5 =$	$5 \times 2 + 5 =$	$5 \times 3 - 2 =$
$25 \div 5 =$	$5 \times 2 - 5 =$	$5 \times 4 + 6 =$
$8 \times 5 =$	$5 \times 8 + 5 =$	$2 \times 9 - 2 =$
$30 \div 5 =$	$5 \times 8 - 5 =$	$3 \times 7 - 5 =$
$7 \times 5 =$	$5 \times 5 + 5 =$	$4 \times 6 + 4 =$
$40 \div 5 =$	$5 \times 5 - 5 =$	$4 \times 8 + 3 =$
$9 \times 5 =$	$5 \times 10 + 5 =$	$4 \times 4 - 4 =$
$35 \div 5 =$	$5 \times 10 - 5 =$	$2 \times 8 - 4 =$
$5 \times 3 =$	$5 \times 7 + 5 =$	$3 \times 5 + 9 =$
$15 \div 3 =$	$5 \times 7 - 5 =$	$3 \times 5 - 9 =$

SIXES.

1. Make *ten* rows of dots with *six* dots in each row.

2. How many dots are there in 2 rows? In 3 rows? In 4 rows? In twice 4 rows?

3. How many rows make 24 dots? 30 dots? 36 dots? 42 dots? 54 dots? 60 dots?

4. Show by dots, 6 + 6 + 6 + 6; 3 times 6.

5.

2 sixes =	5 sixes =	8 sixes =
3 sixes =	6 sixes =	9 sixes =
4 sixes =	7 sixes =	10 sixes =

6. Add by sixes from 0 to 60.
7. Make a multiplication table to 6 × 10.
8. Make a division table to 60 ÷ 6.
9. 3 books at 6 cents each will cost——cents.
10. 5 slates at 6 cents each will cost——cents.
11. 8 tops at 6 cents each will cost ——cents.
12. 6 dots are contained in 12 dots ——times.
13. 6 apples are contained in 24 apples ——times.
14. 6 squares are contained in 42 squares——times.
15. 6 is contained in 42——times.
16. 6 is contained in 54——times.

17.

6 × 2 =	6 ÷ 6 =	42 ÷ 6 + 5 =
6 × 6 =	12 ÷ 6 =	48 ÷ 6 + 6 =
6 × 7 =	24 ÷ 6 =	36 ÷ 6 + 7 =
7 × 6 =	18 ÷ 6 =	30 ÷ 6 + 7 =
6 × 8 =	30 ÷ 6 =	54 ÷ 6 − 9 =
8 × 6 =	60 ÷ 6 =	60 ÷ 6 − 4 =
6 × 9 =	42 ÷ 6 =	30 ÷ 5 + 8 =
9 × 6 =	48 ÷ 6 =	24 ÷ 3 − 5 =
6 × 10 =	36 ÷ 6 =	28 ÷ 4 − 7 =
6 × 1 =	54 ÷ 6 =	27 ÷ 3 + 9 =

SEVENS.

1. Make *ten* rows of dots with *seven* dots in each row.

2. How many dots are there in 2 rows? In 6 rows? In 7 rows? In 8 rows? In 9 rows?

3. How many rows make 21 dots? 28 dots? 42 dots? 49 dots? 56 dots?

4.

2 sevens =	5 sevens =	8 sevens =
3 sevens =	6 sevens =	9 sevens =
4 sevens =	7 sevens =	10 sevens =

5. Add by sevens from 0 to 70.

6. Make a multiplication table to 7×10.

7. Make a division table to $70 \div 7$.

8. 7 quarts of cherries at 7 cents a quart?

9. 4 bottles of ink at 7 cents a bottle?

10. There are 7 days in one week. Name them.

11. How many days are there in 2 weeks? In 3 weeks?

12. How many days are there in 5 weeks? In 9 weeks?

13. How many weeks are there in 21 days? In 42 days?

14. How many weeks are there in 35 days? In 63 days? In 56 days? In 49 days? In 7 days?

15.

$7 \times 2 =$	$56 \div 7 =$	$4 \times 9 + 4 =$
$7 \times 6 =$	$42 \div 7 =$	$5 \times 8 + 7 =$
$6 \times 7 =$	$35 \div 7 =$	$6 \times 6 - 5 =$
$7 \times 7 =$	$49 \div 7 =$	$3 \times 5 - 4 =$
$7 \times 8 =$	$28 \div 7 =$	$3 \times 8 - 7 =$
$8 \times 7 =$	$70 \div 7 =$	$6 \times 9 + 7 =$
$7 \times 9 =$	$63 \div 7 =$	$7 \times 8 + 4 =$
$9 \times 7 =$	$21 \div 7 =$	$6 \times 4 - 9 =$
$7 \times 10 =$	$14 \div 7 =$	$3 \times 7 - 9 =$
$7 \times 4 =$	$7 \div 7 =$	$7 \times 6 + 8 =$

EIGHTS.

1. 8+8= 2 eights=
   8+8+8= 3 eights=
   8+8+8+8= 4 eights=
   8+8+8+8+8= 5 eights=
   8+8+8+8+8+8= 6 eights=
   8+8+8+8+8+8+8= 7 eights=
   8+8+8+8+8+8+8+8= 8 eights=
   8+8+8+8+8+8+8+8+8= 9 eights=
2. Make a multiplication table to 8 × 10.
3. Make a division table to 80 ÷ 10.
4. 8 is contained in 8——time.
   8 is contained in 9——time and——over.
   8 is contained in 16——times.
   8 is contained in 19——times and——over.
   8 is contained in 24——times and——over.
   8 is contained in 28——times and——over.
   8 is contained in 32——times and——over.
   8 is contained in 36——times and——over.
   8 is contained in 40— —times and——over.
   8 is contained in 45——times and——over.
5. Multiply 8 by 3, 8, 6, 9, 7, 5, 4.
6. Divide 24, 48, 72, 80, 56, 64, by 8.
7. Multiply 4 by 7, 4, 8, 5, 3, 6, 9.
8. Multiply 7 by 6, 3, 9, 5, 4, 8, 7.
9. Divide 35, 45, 40, 30, 25, 15, by 5.
10. Divide 24, 36, 48, 42, 54, 18, by 6.
11.

22 ÷ 2 =	24 ÷ 4 =	42 ÷ 7 =
13 ÷ 2 =	27 ÷ 4 =	44 ÷ 7 =
6 ÷ 3 =	30 ÷ 4 =	15 ÷ 7 =
8 ÷ 3 =	40 ÷ 5 =	50 ÷ 7 =
10 ÷ 3 =	44 ÷ 5 =	55 ÷ 7 =
19 ÷ 3 =	46 ÷ 5 =	19 ÷ 7 =

NINES.

1. Add by *nines* to 90.
2. Make a multiplication table to 9×10.
3. Make a division table to $90 \div 9$.
4. How many groups of *nines* must you count in order to get 18? 27? 36? 72? 81? 90?

5.

$9 \times 2 =$	$9 \div 9 =$	$10 \div 9 =$
$9 \times 4 =$	$90 \div 9 =$	$20 \div 9 =$
$9 \times 9 =$	$36 \div 9 =$	$30 \div 9 =$
$9 \times 1 =$	$54 \div 9 =$	$40 \div 9 =$
$9 \times 10 =$	$72 \div 9 =$	$50 \div 9 =$
$9 \times 5 =$	$18 \div 9 =$	$60 \div 9 =$
$9 \times 7 =$	$45 \div 9 =$	$70 \div 9 =$
$9 \times 8 =$	$27 \div 9 =$	$80 \div 9 =$
$9 \times 6 =$	$63 \div 9 =$	$90 \div 9 =$
$9 \times 3 =$	$81 \div 9 =$	$85 \div 9 =$

6.

$5 \times 9 =$	$6 \times 7 =$	$7 \times 8 =$
$3 \times 5 =$	$4 \times 7 =$	$4 \times 3 =$
$5 \times 7 =$	$6 \times 8 =$	$6 \times 9 =$
$6 \times 9 =$	$4 \times 4 =$	$5 \times 2 =$
$4 \times 8 =$	$4 \times 9 =$	$9 \times 7 =$
$3 \times 9 =$	$6 \times 6 =$	$5 \times 5 =$
$5 \times 6 =$	$8 \times 5 =$	$7 \times 7 =$

7. How many 2's in 8, 9, 12, 15, 17, 19, 20?
8. How many 3's in 6, 7, 8, 17, 21, 22, 28, 20?
9. How many 4's in 8, 20, 23, 35, 30, 36, 38, 39?
10. How many 5's in 15, 25, 27, 31, 32, 40, 44, 48?
11. How many 6's in 30, 31, 35, 36, 40, 42, 47?
12. How many 7's in 14, 16, 22, 27, 60, 70?
13. How many 8's in 16, 20, 25, 30, 40, 47, 55?
14. How many 9's in 81, 83, 45, 26, 20, 17?

TENS.

1. Make a multiplication table of *tens* to 100.
2. Make a division table to 100 ÷ 10.
3. **A.** 8, 13, 87, 25, 36, 91, 72, 49, 54, 68.
   B. 7, 60, 73, 55, 64, 79, 98, 81, 22, 34.
   C. 4, 37, 29, 83, 95, 66, 17, 20, 42, 90.
   (*a*) Read each of the above numbers.
   (*b*) Name the *tens* and *units* of which each consists.
   (*c*) How many *units* are required to make the *next ten full.*

(*E.g.*, 16. Sixteen consists of one ten and six units. It requires four units more to make it two tens or twenty.)

4. Copy and complete by filling in the missing sign or number :—

A	B	C
6 × ? = 30	35 = 30 + ?	? × 5 = 50
9 × ? = 27	56 = 49 + ?	? × 7 = 42
7 × ? = 28	22 = 30 − ?	? ÷ 4 = 4
36 ÷ ? = 6	38 = 45 − ?	? ÷ 3 = 6
45 ÷ ? = 5	24 = 3 × ?	? + 10 = 31
18 + ? = 26	81 = 9 × ?	? + 30 = 70
54 − ? = 47	28 = 4 + ?	? − 7 = 17
$\frac{1}{3}$ of ? = 12	28 = 4 × ?	? − 8 = 16

D	E	F
2 × 4 + ? = 9	$\frac{1}{3}$ of 30 = ?	8 ? 7 = 15
3 × 8 + ? = 34	$\frac{1}{2}$ of ? = 8	8 ? 7 = 1
6 × 6 − ? = 30	$\frac{1}{4}$ of ? = 9	8 ? 7 = 56
8 × 8 − ? = 60	$\frac{1}{3}$ of ? = 7	14 ? 7 = 2
19 = 3 × 6 + ?	? of 18 = 6	17 ? 9 = 8
25 = 5 × 5 + ?	? of 40 = 10	7 ? 9 = 63
44 = 6 × 7 + ?	? of 20 = 10	56 ? 7 = 8
85 = 9 × 9 + ?	$\frac{1}{3}$ of 21 = ?	100 ? 10 = 90

VI. (*Sight, with oral statement.*)

A

1. What will 5 tops cost at 4 cents each?

Ans. 20 cents.

(*Oral Statement.*—If one top costs 4 cents, 5 tops will cost 5 times 4 cents, or 20 cents.)

2. Cost of 3 yards of cloth at 5 dollars a yard?

3. A man walks 4 miles an hour; how many miles in 7 hours?

4. At 7 cents a mile, what will it cost to ride 7 miles?

5. Eight trees in a row, how many trees in 8 rows?

6. Weight of 4 geese, if each weighs 9 pounds?

7. Cost of 4 yards of calico at 6 cents a yard? At 7 cents a yard? At 9 cents a yard?

8. A steamer goes 10 miles an hour, how far will she go in 5 hours? In 7 hours? In 10 hours?

9. Six rows of houses 9 in a row. How many?

10. If you arrange counters in little heaps, each heap containing 10 counters, how many will there be in 4 heaps? 2 heaps? 6 heaps? 10 heaps? 5 heaps and 3 counters over? 9 heaps and 8 counters over? 1 heap and [illegible] counters over?

B

1. How many tops at 3 cents can be bought for 15 cents?

(*Oral Statement.*—15 cents will buy as many tops as there are 3's in 15, or 5 tops.)

2. How many heaps of 5 counters each will 20 counters make?

3. How many bundles of 6 pens each will 24 pens make?

4. How many rows of 8 in a class of 32?

5. How many five-cent pieces in 40 cents?

6. How many sevens in forty-two?

7. How many two-cent buns for eighteen cents?

8. A bag holds 3 bushels of potatoes; how many bags will be required to hold 24 bushels? 30 bushels?

9. How many sheep can a farmer buy for 54 dollars, if he pays six dollars each? 9 dollars each?

10. How many heaps of *nines* must you count in order to get 18? 45? 63? 81?

C

1. If 4 pears cost 12 cents, what will 1 pear cost?

(*Oral Statement.*—One pear will cost *one-fourth* of 12 cents, or 3 cents.)

2. A man divided 24 cents among 4 boys; how many cents did each boy receive?

3. If 70 counters are distributed in a class of 7 pupils, how many will each receive?

4. A horse trotted 42 miles in 6 hours; how many miles did he trot in one hour?

5. 27 trees are planted in 3 rows; how many trees are there in each row?

6. A vessel sails 40 miles in 5 hours; how many miles can she sail in one hour?

7. A school having 72 pupils is divided into 8 equal classes; how many pupils are there in each class?

8. Six rough boys broke a pane of glass that cost 60 cents; how much ought each to pay?

9. If you pay 32 cents to travel 8 miles on the railway, how much is that for each mile?

10. What is one-half of 14? One-third of 18? One-fourth of 24? One-fifth of 35? One-sixth of 30? One-seventh of 42? One-eighth of 72? One-ninth of 54? One-tenth of 80?

VII.

NUMBERS 100 TO 1000.

One hundred		100
One hundred and one	(100+1)	101
One hundred and two	(100+2)	102
One hundred and three	(100+3)	103
One hundred and nine	(100+9)	109
One hundred and ten	(100+10)	110
One hundred and eleven	(100+10+1)	111
One hundred and twelve	(100+10+2)	112
One hundred and thirteen	(100+10+3)	113
One hundred and twenty	(100+20)	120
One hundred and thirty	(100+30)	130
One hundred and forty	(100+40)	140
One hundred and ninety	(100+90)	190
Two hundred		200
Three hundred		300
Four hundred		400
Eight hundred		800
Nine hundred		900
One thousand	(10 hundred)	1000

1. Read 222.

What does the figure in the *first place* denote?

What does the figure in the *second place* denote?

What does the figure in the *third place* denote?

2. What does each figure denote in the following numbers:—125, 236, 342, 185, 276, 541, 802, 930, 111, 119, 190, 910, 400, 1000?

3. Name the numbers 500, 200, 400, 100, 900.

4. Express by figures *four hundred, seven hundred, eight hundred, ten hundred,* 17 *hundred.*

5. Write the numbers which are made up as follows:

Three hundreds, two tens, five units.
Four hundreds, six tens, two units.
Five hundreds, five tens, five units.
Six tens, four units, eight hundreds.
Nine units, four hundreds, three tens.
Eight tens, seven hundreds, four units.
Eight hundreds, four units, no tens.
Three hundreds, seven units.
Four hundreds, eight tens.
Nine hundreds, six tens.

6. Read the following numbers and tell how each is made up:—

683	227	999	784	804	300
769	333	444	111	240	439

7. Write in figures:—

Six hundred and forty-seven.
Five hundred and eighty-four.
Nine hundred and thirteen.
Four hundred and fifty.
Three hundred and ten.
Two hundred and three.

8. Write in figures the hundreds from 100 to 1000.

9. Write in figures the numbers from 100 to 110.

10. Write in figures the numbers from 110 to 120.

11. Write nine hundred and ninety-nine in figures.

12. How many are 999 and 1 more?

13. How many figures are required to write one thousand.

14. Write the largest number expressed by three figures; by two figures; by one figure.

15. Write the smallest number expressed by three figures; by two figures; by one figure.

VIII.

A

1	2	3	4	5	6
320	202	121	523	413	131
354	143	363	134	231	406
412	430	405	241	321	341
7	**8**	**9**	**10**	**11**	**12**
243	110	123	213	413	325
204	371	341	435	234	253
351	408	333	120	142	410

B

1	2	3	4	5	6
240	374	428	549	693	786
257	382	427	587	668	748
284	361	476	578	697	767
7	**8**	**9**	**10**	**11**	**12**
857	989	789	727	659	728
835	964	907	686	657	457
876	986	947	730	764	909
13	**14**	**15**	**16**	**17**	**18**
793	987	783	789	765	467
905	888	775	437	853	582
738	845	548	829	546	547
19	**20**	**21**	**22**	**23**	**24**
724	754	863	978	744	856
475	673	643	838	648	897
673	858	576	975	967	987

C

1	2	3	4	5	6
883	876	952	875	725	464
988	563	989	795	675	767
454	808	873	207	538	420
961	765	867	597	758	585

7	8	9	10	11	12
794	193	984	906	878	417
509	708	957	967	895	380
362	237	876	780	868	654
636	567	898	890	899	746

13	14	15	16	17	18
689	625	632	445	789	784
607	678	567	657	854	789
512	233	429	234	881	786
389	765	576	369	869	988

D

1	2	3	4	5	6
302	430	500	17	701	906
43	86	46	787	15	84
568	403	19	63	89	65

7	8	9	10	11	12
840	845	672	305	276	30
340	468	89	719	498	657
79	30	306	48	524	862
434	404	25	506	99	76

E

1. 9, 17, 204.
2. 96, 296, 815.
3. 196, 118, 64.
4. 79, 110, 769.
5. 519, 371, 75.
6. 236, 184, 348.
7. 85, 222, 376.
8. 9, 14, 76, 232.
9. 399, 87, 204, 7.
10. 825, 716, 98.
11. 16, 327, 213, 45.
12. 55, 67, 78, 9, 4, 18.

F

1. 427+342+56.
2. 100+483+75.
3. 15+603+60.
4. 700+145+63.
5. 41+425+398.
6. 490+30+478.
7. 327+49+8+569.
8. 960+15+23+500.
9. 749+7+64+784.
10. 32+284+19+6.
11. 325+607+28+763.
12. 5+987+603+86.

G

1. Three hundred and five, two hundred and forty-six, one hundred and sixty.

2. Forty-eight, seventeen, nine, twenty-nine.

3. Eighty-three, twenty-one, nineteen, 87.

4. Eight, forty-three, 264, ninety-two.

5. Fifty, sixty-two, two hundred and ninety-six.

6. Seven hundred and eighty-three, 492.

7. Nine hundred and ninety-nine, 685, ninety-nine, 85, nineteen.

8. Five hundred and sixty, 804, seventy-eight.

9. Sixty, seven hundred and thirty, two hundred and ninety-eight, four hundred and seventy-six.

10. Eight hundred and eighty-eight, four hundred and nineteen, ninety-six, seven hundred and sixty-five.

11. Seventeen, ninety, 987, nine hundred and one, 655.

IX.

A

A figure in the fourth place is read as **thousands.**

1	2	3	4	5	6
4678	5374	6487	7636	8768	9689
1435	2142	3243	4212	5243	6476
7	**8**	**9**	**10**	**11**	**12**
9076	8275	8799	8591	5076	8591
4054	3251	2542	7230	3075	6421

B

1	2	3	4	5	6
7548	7391	8476	9764	8544	9789
4820	4681	5696	7345	7095	7465
7	**8**	**9**	**10**	**11**	**12**
4165	7246	8670	7265	2148	3067
2340	4161	7364	3167	2037	2614
13	**14**	**15**	**16**	**17**	**18**
8164	2653	1706	8470	6790	7200
5702	1403	1063	2138	3245	3647
19	**20**	**21**	**22**	**23**	**24**
3712	9100	8503	6794	8649	6070
1831	3340	3138	3778	2495	4226

C

1	2	3	4	5	6
8416	6746	9876	6020	7050	6040
3793	3966	5086	4873	2478	2896
7	**8**	**9**	**10**	**11**	**12**
6500	7200	5700	2514	2000	5640
2746	3647	3218	1777	1862	2739
13	**14**	**15**	**16**	**17**	**18**
6000	9001	8400	7080	6073	5106
3719	6713	5142	3926	3889	3089
19	**20**	**21**	**22**	**23**	**24**
8000	7003	6200	8010	6207	9010
1568	3350	1701	1675	1277	1111

D

1	2	3	4	5	6
7014	5602	7023	3506	6019	5609
277	675	189	920	557	582
7	**8**	**9**	**10**	**11**	**12**
9426	8617	1000	4679	4084	5500
29	73	56	73	697	7

E

1. 8297 − 6751.	7. 7030 − 648.	13. 8010 − 4798.
2. 7009 − 4292.	8. 7000 − 4139.	14. 7235 − 56.
3. 8715 − 4286.	9. 7490 − 594.	15. 5124 − 98.
4. 9237 − 4615.	10. 4786 − 1234.	16. 8400 − 17.
5. 8073 − 3276.	11. 8507 − 763.	17. 8785 − 7.
6. 9594 − 5868.	12. 6735 − 856.	18. 8047 − 7428.

F

Find the difference between:—

1. *9020 and 1460.	7. 5000 and 783.	13. 705 and 694.
2. 3471 and 8058.	8. 6000 and 830.	14. 581 and 809.
3. 2154 and 7041.	9. 4000 and 769.	15. 39 and 852.
4. 6079 and 238.	10. 4030 and 75.	16. 476 and 68.
5. 267 and 5030.	11. 93 and 1000.	17. 205 and 81.
6. 387 and 9064.	12. 69 and 5048.	18. 75 and 308.

* Be sure to put the larger number at the top.

G

Find the difference between:—

1. Four hundred and fifty-three *and* two hundred and seventeen.
2. Five hundred *and* two hundred and forty-seven.
3. Ninety-four and fifty-eight.
4. Nine hundred *and* eight hundred and seventy-three.
5. Eighty *and* five hundred and forty-one.
6. Six hundred and fifty-five *and* seventy-seven.
7. Seven hundred and one *and* 5000.
8. Five hundred and sixty-nine *and* one thousand.
9. Twenty-two *and* one hundred and three.
10. 5004 *and* eight hundred and sixty-nine.

X.

A

1	2	3	4	5	6	7	8
23	26	41	57	52	75	22	68
2	2	3	3	4	4	5	5
9	10	11	12	13	14	15	16
32	62	47	53	87	96	50	74
6	6	7	7	8	8	9	9
17	18	19	20	21	22	23	24
94	86	53	78	86	94	83	96
7	5	7	9	8	5	4	9
25	26	27	28	29	30	31	32
97	53	47	79	35	86	56	63
3	3	7	4	8	2	7	8
33	34	35	36	37	38	39	40
15	37	69	58	85	67	77	99
9	6	4	5	6	7	8	9

B

1. 471×2.
2. 382×3.
3. 691×4.
4. 572×5.
5. 637×6.
6. 841×7.
7. 582×8.
8. 761×9.
9. 916×3.
10. 805×4.
11. 287×5.
12. 637×6
13. 650×7.
14. 783×8.
15. 379×9.
16. 206×2.
17. 487×3.
18. 936×4.
19. 258×5.
20. 846×6.
21. 708×7.
22. 866×8.
23. 674×9.
24. 573×9.

C

1. Multiply 6723 by 2, 3, 4, 5, 6, separately.
2. Multiply 4576 by 2, 3, 4, 5, 6, separately.
3. Multiply 3809 by 7, 8, 9, separately.
4. Multiply 7632 by 7, 8, 9, separately.
5. Multiply 4572 by 2, 3, 4, 5, 6, 7, 8, 9, separately.
6. Multiply 8903 by 2, 3, 4, 5, 6, 7, 8, 9, separately
7. Multiply 6187 by 2, 3, 4, 5, 6, 7, 8, 9, separately.

D

1. Multiply one hundred and twenty-two by eight.
2. Multiply ninety-seven by seven.
3. Multiply one hundred and eighty-nine by six.
4. Multiply eighty-nine by 5, 6, 7, 8, 9, separately.
5. At ninety-seven dollars an acre what will 8 acres of land cost?
6. A box weighs one hundred and sixty-three pounds; what will be the weight of 6 similar boxes?
7. A balloon goes at the rate of 27 miles an hour; how far will it go in nine hours?
8. If one barrel of flour contains one hundred and ninety-six pounds, how many pounds will there be in four barrels?
9. There are 24 hours in a day; how many hours in a week (seven days)?
10. A horse can draw as much as four men. One man can draw 614 pounds; what can a horse draw?
11. At 75 dollars each, what will 8 horses cost?
12. At 95 dollars each, what will 5 waggons cost?
13. If a boy earns 87 cents in a day, how much will he earn in six days?

XI.

A (*Oral.*)

1.	2)	3	11	9	15	19	5	13	7	17	18
2.	3)	7	11	15	19	20	29	24	18	16	22
3.	4)	7	19	23	24	38	29	17	30	33	36
4.	5)	10	13	38	29	32	41	48	37	19	20
5.	6)	10	50	59	34	25	51	44	16	31	42
6.	7)	11	18	26	33	16	59	62	69	55	46
7.	8)	33	34	39	55	67	77	52	74	50	26
8.	9)	15	25	34	37	47	69	58	85	70	40

B

1. $428 \div 2$.	13. $952 \div 8$.	25. $423 \div 7$.	37. $444 \div 6$.
2. $396 \div 3$.	14. $618 \div 6$.	26. $547 \div 6$.	38. $341 \div 7$.
3. $848 \div 4$.	15. $972 \div 9$.	27. $735 \div 5$.	39. $456 \div 8$.
4. $976 \div 2$.	16. $826 \div 7$.	28. $806 \div 4$.	40. $369 \div 9$.
5. $976 \div 4$.	17. $513 \div 2$.	29. $878 \div 3$.	41. $234 \div 6$.
6. $815 \div 5$.	18. $719 \div 3$.	30. $723 \div 2$.	42. $123 \div 7$.
7. $430 \div 5$.	19. $623 \div 4$.	31. $699 \div 9$.	43. $417 \div 8$.
8. $523 \div 3$.	20. $749 \div 5$.	32. $796 \div 8$.	44. $193 \div 9$.
9. $956 \div 4$.	21. $875 \div 6$.	33. $670 \div 7$.	45. $538 \div 2$.
10. $216 \div 6$.	22. $643 \div 7$.	34. $749 \div 6$.	46. $808 \div 3$.
11. $427 \div 7$.	23. $927 \div 8$.	35. $736 \div 5$.	47. $212 \div 4$.
12. $504 \div 7$.	24. $705 \div 9$.	36. $543 \div 4$.	48. $936 \div 5$.

C

1. $1678 \div 2$.	11. $2915 \div 5$.	21. $2968 \div 8$.
2. $1578 \div 2$.	12. $4434 \div 6$.	22. $4865 \div 7$.
3. $1035 \div 3$.	13. $5022 \div 6$.	23. $6642 \div 9$.
4. $2214 \div 3$.	14. $2910 \div 6$.	24. $5373 \div 9$.
5. $1752 \div 3$.	15. $3759 \div 7$.	25. $7524 \div 9$.
6. $2572 \div 4$.	16. $6041 \div 7$.	26. $5688 \div 6$.
7. $3356 \div 4$.	17. $5243 \div 7$.	27. $1895 \div 5$.
8. $1556 \div 4$.	18. $6696 \div 8$.	28. $8613 \div 9$.
9. $3690 \div 5$.	19. $4632 \div 8$.	29. $1971 \div 3$.
10. $3235 \div 5$.	20. $3968 \div 8$.	30. $4784 \div 8$.

D

1. Divide 2520 by 2, 3, 4, 5, 6, 7, 8, 9, separately.
2. Divide 3960 by 2, 3, 4, 5, 6, 7, 8, 9, separately.
3. Divide 4752 by 2, 3, 4, 5, 6, 7, 8, 9, separately.
4. How many 7's are there in 2695?
5. How often is 2 contained in 648?
6. Divide 648 plums equally among 8 boys.
7. How many times are 9 dollars contained in 8046 dollars?
8. If slates cost 6 cents each, how many can you buy for 636 cents?
9. If 124 children were put equally in 4 classes, how many in each class?
10. Three feet make a yard; how many yards are there in 291 feet?
11. A quart of milk costs 5 cents; how many quarts can you buy for 630 cents?
12. How many 3's are there in 3369?
13. How many 6's are there in 5238?

1. 2968 ÷ 8.
2. 4865 ÷ 7.
3. 6642 ÷ 9.
4. 5373 ÷ 9.
5. 7524 ÷ 9.
6. 5688 ÷ 6.
7. 1895 ÷ 5.
8. 8613 ÷ 9.
9. 1971 ÷ 3.
0. 4784 ÷ 8.

9, separately.
9, separately.
9, separately.

8 boys.
ntained in 8046

any can you buy

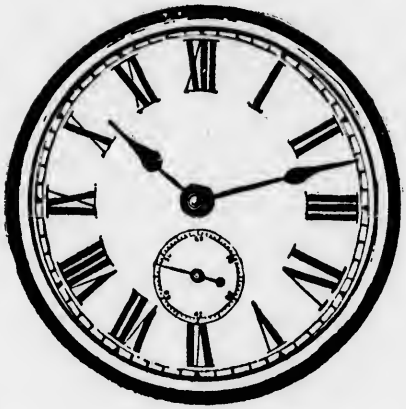
in 4 classes, how

many yards are

now many quarts

XII.

TIME.



1. Read and copy I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII.

2. Into how many parts is the face of a clock divided?

3. What is the longer hand called, and how often does it go round?

4. What is the other hand called, and how often does it go round?

5. How long does it take the minute-hand to pass from XII to I? From I to II? etc.

6. How long the hour-hand?

7. How many minutes in an hour? In half-an-hour?

8. How many hours in a day? In half-a-day?

9. How many days in a week? Name them.

10. How many weeks in a month?

11. How many months in a year? Name them.

12. How many seasons in a year? Name them.

13. What time is it when both hands of the clock point to XII? To III? To X?

XIII.

CAPACITY.

1 gallon. 1 quart. 1 pint.

1. There are 2 pints in a quart.

2. There are 4 quarts in a gallon.

3. How many times must you fill the pint measure to make a quart?

4. How many times must you fill the quart measure to make a gallon?

5. How many times must you fill the pint measure to make a gallon? (— pints = 1 gallon).

6. How many pints in 2 quarts? In 3 quarts? In 4 quarts?

7. How many quarts in 2 gallons? In 4 gallons?

8. How many cups of water, each holding half-a-pint, will make a pint? A quart? A gallon?

9. What will a quart of milk cost at 3 cents a pint?

10. What will a gallon of milk cost at 7 cents a quart?

11. How many quarts are there in 8 pints?

12. How many quarts in 11 pints and what over?

13. How many gallons in 10 quarts and what over?

14. What part of a quart is a pint?

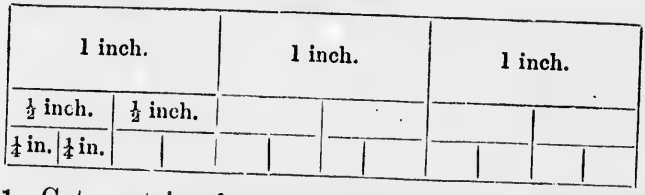
15. What part of a gallon is a quart?

16. How many quarts in half-a-gallon?

17. How many pints in 2 quarts and a half?

XIV.

LENGTH.



1. Cut a strip of paper 12 inches long and one inch wide. Mark the inches. (Use foot-rule.)

2. Draw a line, as near as you can, 2 inches long, and then measure the line. Draw one 3 inches long; 4 inches.

3. Guess how long and wide this page is; then measure to see how near your guess was.

4. Draw on the board a line 6 inches long, and another 12 inches long. (12 inches make a foot.)

5. How many feet long was the strip of paper that you cut out?

6. Draw a line a foot long. 2 feet. 3 feet.

7. How long and how wide is your slate? The top of your desk? Guess and measure.

8. 3 feet make a yard. Draw a line a yard long.

9. 2 yards are how many feet? 3 yards? 4 yards?

10. Copy and complete: learn to repeat:—

2 pints =	60 minutes =
4 quarts =	24 hours =
12 inches =	7 days =
3 feet =	4 weeks =

11. Copy and fill in:—

4 quarts = ——pints.	½ hour = ——minutes.
½ gallon = ——quarts.	¼ hour = ——minutes.
2 feet = ——inches.	6 months = ——year.
½ foot = ——inches.	¼ year = ——months.

XV.

MENTAL EXAMPLES.

1. Add 9, 4, 7, 6, 5.
2. From $7+8+5$ take 9.
3. 5×9; 6×7; 4×8; 3×5.
4. From 3 times 3 take twice 4.
5. 40 roses; 9 faded; how many left?
6. Cost of 7 oranges at 4 cents each?
7. $\frac{1}{3}$ of 9 yards?
8. 18 books are put 6 in a pile. How many piles?
9. 2 pints in a quart; how many pints in 3 quarts and 1 pint?
10. In 16 pints how many quarts?

1. 4×5; 3×6; 6×8; 3×9.
2. $36\div9$; $24\div3$: $63\div7$.
3. Take 15 from 23.
4. From twice 8 take 3 times 5.
5. Add 12, 8, 9, 7, 3.
6. How many are 4 eights aud 2 fives?
7. How many oranges in $\frac{1}{2}$ of 18 oranges?
8. How many slates at 7 cents can you buy for 35 cents?
9. Into how many heaps of 9 can you put 72 counters?
10. From 5 tens take 30.

1. To 6 times 7 add 5.
2. From 9 times 5 take 6.
3. $12+4+6+2+5$.
4. $23-7+3-4$.
5. Divide 54 marbles equally among 6 boys.
6. How many 3-cent stamps can you buy for 21 cents?

7. When a number is divided into 4 equal parts, what is each part called?

8. Divide 56 blocks into 8 equal piles.

9. 45 requires how many to make 53?

10. You have 40 cents and buy 7 quarts of berries at 5 cents a quart; how many cents have you left?

1. To 3 times 6 add 12.

2. How often is 6 cents contained in 39 cents, and how many cents are left over?

3. $\frac{1}{2}$ of 16; $\frac{1}{5}$ of 30; $\frac{1}{8}$ of 24.

4. How many does 21 need to make 40?

5. How many toes have 3 men, if one has a wooden leg?

6. Mary is 5 years older than Jane, who is 8. What is Mary's age?

7. I have 32 peaches and sell 6. How many left?

8. 4 trout, 9 bass, 5 perch, 11 pike. How many fish?

9. How many fingers and toes counted together have 3 girls?

10. How many minutes in one hour and 20 minutes?

1. From $4+7+9$ take 13.

2. Take 9 from $20+12$.

3. How many legs have 4 horses and 2 boys?

4. How many quarters in 5 apples?

5. Tom and Robert have 8 marbles each. Tom gave Robert 3 of his; how many had each then?

6. 30 days in June; 9 were wet; how many were dry?

7. My basket holds 50 eggs, and I wish to fill it. I have 43 eggs; how many more do I require?

8. 40 marbles; won 7 and lost 4. How many now?

9. How many 4-cent candles can you buy for 32 cents?

10. $87+8$; $95-8$; 8×9; $63\div 9$.

XVI.

TEST EXERCISES.

A

1. $47+96+300+74+219$. 2. $513-294$.

3. I want 53 counters to make 100; how many have I?

4. One town has 4209 inhabitants; another town has 3 times as many. How many people live in the second town?

5. If 4 fishermen catch 920 fish and divide them equally, how many fish will each have?

B

1. Add 26, 409, 73, 800, 5. 2. From 1000 take 101.

3. There are 1760 yards in a mile. How many yards are there in 5 miles?

4. I bought 7 cows at one time, and then 4 times as many, and then 19. How many had I then?

5. If a clock ticks 7200 times in two hours, how often is that in an hour?

C

1. *From* nine hundred and seventy *take* eighty-nine.

2. A boy had 15 marbles to begin with; he won 59 and lost 63; how many had he left?

3. $25+31+76-79$. 4. Divide 5080 by 7.

5. In each year there are 365 days; how many days in 8 years?

D

1. January has 31 days, February 28, March 31, April 30, May 31. How many days in the 5 months?

2. There are 150 children in a school; 13 are absent; how many are present?

3. How many sixes in 846? 4. 5987×7.

5. If nuts are sold at 9 for a cent, how much must I pay for 963?

E

1. *Add* nineteen, six hundred and seventy-one, fifty-five, eight, ninety-seven.

2. A farmer had 200 sheep; he sold 87 and 25 died; how many remained?

3. How many pints are there in 287 quarts?

4. One-seventh of 931. 5. Eight times 298.

F

1. In a certain school there are 70 children in the Kindergarten, 84 in the Primary Grade, 106 in the Intermediate, and 39 in the Senior; how many pupils in the school?

2. $1000 - 901$. 3. $603 - 590 + 168$.

4. Nine times seven hundred and sixty-three.

5. One-fifth of four hundred and fifty.

G

1. A farmer raised 570 bushels of wheat, 394 bushels of rye, 769 bushels of corn, and 414 bushels of oats; how many bushels of grain did he have?

2. Each of 7 wives had 7 cats, and each cat had 7 kittens; how many kittens were there?

3. Each of 6 houses has 22 windows, and each window has 9 panes of glass; how many panes of glass altogether?

4. In 7 pieces of cloth there are 364 yards. How many yards in each piece?

5. In 400 eggs 50 were bad and 33 broken. How many were good and whole?

XVII.

NUMBERS TO 1,000,000.

1. What number is represented by 816?

2. What do the different figures stand for?

Ans. 816 = 8 hundreds + 1 ten + 6 units.

3. What do the different figures represent in 982? In 328? In 160? In 607? In 300?

4. Counting from the right, what is the *first place* called? The *second* place? The *third* place?

5. Write the numbers that have:—

(*a*) 2 in the hundreds' place, 6 in the units', 3 in the tens'.

(*b*) 4 in the tens' place, 1 in the hundreds' place.

(*c*) 2 in the units' place, 5 in the hundreds' place.

(*d*) 8 in the hundreds' place, 7 in the tens' place.

6. In reading or writing numbers we divide into **periods** of *three figures* each, as below:—

THOUSANDS.			UNITS.		
Hundreds.	Tens.	Units.	Hundreds.	Tens.	Units.
3	5	4	3	5	4

7. What is the name of the *first period?*

Ans. The period of units.

8. What is the name of the *second period?*

Ans. The period of thousands.

9. What does each figure in these periods express?

Ans. The *first* expresses the *units* of the period; the *second*, the *tens* of the period; the *third*, the *hundreds.*

10. Read the number expressed in ex. 6.

Ans. 354 thousands, 354 units.

(It is usual to omit the *name* of the units' period.)

11. Divide into periods and express in words:—

A	B	C	D
1236	52625	125643	10400
3042	38900	250046	100400
8205	71005	465030	123456
7600	59206	600040	400101
4053	60075	100403	900009
6110	89200	401020	314607

12. Write in figures (*from dictation*):—

419 thousand and 312; 9 thousand and 1.
301 thousand and 806; 450 thousand and 39.
32 thousand and 65; 173 thousand.
300 thousand and 8; 6 thousand 385.

13. Express in figures:—

Seven thousand and four.
Five thousand three hundred and nine.
Ten thousand one hundred and ten.
Eighty thousand three hundred and thirty-three.
Six thousand and sixty.
Five hundred thousand two hundred and one.
Eight hundred and forty thousand and nineteen.
Six hundred thousand and seventy.

14. In what place must the *units* of thousands be written? The *tens* of thousands? The *hundreds* of thousands?

15. What is the *place-value* of the figure 9 in each of the following numbers:—90, 390, 947, 109, 3900, 9465, 90302, 195620, 954032, 900101.

16. What is **Notation?**

Ans. The art of expressing numbers in *figures?*

17. What is **Numeration?**

Ans. The art of expressing numbers in *words.*

18. What is the value of each figure in the number 99?

19. How many times greater is the 9 in the *second* place than the 9 in the *first* place?

20. Compare the values of the figure 2 in 22 and in 220.

21. How does the *place-value* of a figure increase?

Ans. *By the scale of ten;* that is, 10 of a lower place make 1 of the next higher.

22. What is this notation *by the scale of ten* called?

Ans. The *decimal* notation.

23. Give the scale to millions:—

10 units = 1 ten
10 tens = 1 hundred.
10 hundreds = 1 thousand.
10 thousands = 1 ten thou.
10 ten thou. = 1 hun. thou.
10 hun. thou. = 1 million.

Test Questions.

1. Name the nine significant digits (figures).

2. What is the non-significant digit (figure)?

3. When two digits (figures) are placed side by side, what does the first denote? What, the second?

4. How many times greater is 2 in the second place than 2 in the first place?

5. How many units make a *ten*? How many *tens*, a *hundred*? How many *hundreds*, a *thousand*?

6. Give the smallest and the largest number that can be expressed by one figure; by two figures; by three figures; by four figures; by five figures.

7. What does the digit 1 denote when standing in the *first* place? In the *second* place? In the *third* place? In the *fourth* place? In the *fifth* place?

8. What is the value of 5 *two* places up (in the second place)? Of 6 *three* places up? Of 7 *four* places up? Of 8 *five* places up?

9. What is notation in the scale of *ten* called?

XVIII.

100 cents = 1 dollar,
100¢ = $1.00.

The *sign* $ stands for the word *dollars*.
The *sign* ¢ stands for the word *cents*.
$5 and 25¢ are written together, $5.25.

1. Read the following:—

$6	7¢	$1.25	$93.08	$0.69	$.24
$25	17¢	$6.36	$41.50	$0.20	$.06
$16	40¢	$8.32	$67.01	$0.03	$.90
$92	89¢	$9.59	$48.10	$0.07	$.02

2. Write with the proper signs:—
Thirteen dollars and forty-eight cents.
Seven dollars and nine cents.
Five dollars and ninety cents.
One hundred dollars and one cent.

3. Write in *two* ways 75 cents; 95 cents; forty cents; 8 cents; 3 cents; one cent.

4. Read, arrange and add:—
(*a*) $8.25, $27.48, $13.06, $407.39, $80.05.
(*b*) $573, $65.32, $802.05, $850.73, $90.50.
(*c*) $6.36, $99.43, $6.07, $70.50.
(*d*) $0.48, $6, 59¢, 8¢, $1.60, nineteen cents.
(*e*) Ninety cents, seven cents, $1.09, 35¢, $5.70.

5. Multiply each of the following by 5; by 6; by 7:—
$3; $0.03; $0.65; $1.25; $3.75; $5.09.

6. Divide each of the following by 2; by 4; by 8:—
$16; $0.16; $8.08; $4.48; $1.04; $5.20.

7.

From	$67.25	$79.21	$20.00	$10.00
Take	52.14	54.83	14.39	1.65

XIX.

1. What is **Addition**?

Ans. The method of finding a number equal to two or more given numbers.

2. What is the result of an addition called?

Ans. The **sum.**

3. What are the numbers to be added called?

Ans. The **addends.**

4. What is the sign of addition?

Ans. Plus +. It means *and* or *added to.*

(8+7=15 is read *eight plus seven equals fifteen.*)

A (*Oral*).

1. Count separately by *twos, threes, fours, fives, sixes, sevens, eights, nines,* starting at 0, till the sum is 100.

2. Count separately by *twos, threes, fours, fives, sixes, sevens, eights, nines,* starting at 1, till the sum is 100.

3. Count separately by *threes, fours, fives, sixes, sevens, eights, nines,* starting at 2, till the sum is 100.

4. Count separately by *fours, fives, sixes, sevens, eights, nines,* starting at 3, till the sum is 100.

5. Count separately by *fives, sixes, sevens, eights, nines,* starting at 4, till the sum is 100.

6. Count separately by *sixes, sevens, eights, nines,* starting at 5, till the sum is 100.

7. Count separately by *sevens, eights, nines,* starting at 6, till the sum is 100.

8. Count separately by *eights* and *nines,* starting at 7, till the sum is 100.

9. Count by *nines,* starting at 8, till the sum is 100.

B

Add silently, at sight, without copying:—

1. 2, 4, 3, 5, 4, 6, 5, 3, 6, 2, 4.
2. 3, 4, 7, 2, 6, 5, 3, 2, 4, 3, 5.
3. 5, 4, 6, 4, 7, 3, 2, 6, 7, 5, 3, 4.
4. 6, 5, 4, 2, 3, 4, 6, 7, 3, 4, 5, 2.
5. 7, 3, 4, 7, 8, 6, 7, 1, 3, 5, 6, 8, 2, 7.
6. 8, 4, 5, 6, 4, 8, 6, 5, 4, 3, 7, 9, 2, 4.
7. 9, 4, 3, 6, 1, 8, 3, 5, 2, 4, 6, 3, 7, 5.
8. 7, 4, 6, 2, 5, 8, 7, 3, 4, 9, 2, 7, 4, 3, 6.
9. 8, 6, 5, 9, 1, 8, 5, 6, 2, 6, 3, 5, 8, 7, 4, 2.
10. 9, 8, 6, 4, 5, 6, 7, 1, 3, 6, 4, 7, 2, 5, 8, 6, 3.

C (*Sight or from dictation*).

1. 52+43.
2. 23+16.
3. 21+57.
4. 32+45.
5. 44+24.
6. 18+16.
7. 17+23.
8. 41+19.
9. 43+28.
10. 44+37.
11. 24+16.
12. 72+25.
13. 33+17.
14. 63+54.
15. 72+28.
16. 37+33.
17. 53+38.
18. 64+14.
19. 35+48.
20. 29+61.
21. 43+18.
22. 38+37.
23. 65+26.
24. 17+45.
25. 39+48.
26. 19+18.
27. 76+16.
28. 47+28.
29. 19+72.
30. 32+29.
31. 28+33.
32. 55+37.
33. 86+19.
34. 66+27.
35. 25+39.
36. 67+28.
37. $16.20+$20.30.
38. $34.10+$26.80.
39. $26.60+$54.20.
40. $27.30+$30.40.
41. $57.26+$10.64.
42. $55.12+$15.38.
43. $11.43+$24.24.
44. $42.82+$56.18.
45. $67.26+$33.54.
46. $43.59+$47.21.
47. $25.51+$26.49.
48. $43.49+$15.18.
49. $16.35+$25.38.
50. $92.11+$30.14.
51. $79.06+$44.11.
52. $13.58+$16.61.
53. $18.56+$18.95.
54. $26.65+$36.44.

D

1	2	3	4	5
8642	3547	9876	57134	64762
6284	7109	4193	10398	598
3157	2345	6666	83127	8219
4915	6982	7575	92065	49325

6	7	8	9	10
46728	87956	93056	63924	59873
83192	67895	24918	2138	8796
56421	56789	93	98888	487
45679	78965	64717	73925	70415
35954	98765	79628	5497	6935

11	12	13	14	15
72715	81059	345678	9135	61928
89346	7291	49	890123	939495
34215	46231	8193	135791	828486
72853	67891	724198	15937	713
46108	465	817	2084	2645
94211	2845	45903	17395	417257

16	17	18	19	20
38496	38479	72635	987987	13517
57328	54768	48723	798798	986248
61934	75943	51397	778899	14703
24689	89235	35864	897897	24863
12345	45687	26478	879987	397139
76513	97856	87952	789789	32828

E

Find the sum of:—

1. 321, 61082, 98765, 42653.
2. 21463, 72715, 4839, 55793.
3. 858521, 936266, 34728, 796210, 514344.
4. 9625, 384, 56, 77676, 619145, 72167.
5. 73810, 4832, 61453, 967534, 8593, 893415.
6. 52718, 46, 905, 68, 3914, 830218, 445566.
7. 14826, 754, 11235, 97, 998843, 6783, 2145.
8. 7243, 98327, 489, 873215, 52947, 93826.
9. 839478, 953165, 6423, 684529, 877, 13985.
10. 210987, 185296, 25, 470369, 26048, 38383.
11. 219, 7219, 5968, 7368, 47283, four thousand and twenty-seven.
12. 906, 170031, 3002, 969, 596, 5871, two hundred and ten thousand and ten.
13. Nine times 987.
14. 7906, 1894, 9046 and five times 9897.
15. 3 times 1198, 4 times 4736, 5 times 7968.
16. 472919, 800316, 92769, 39603, 157 and 3 times one hundred and ninety-nine.
17. Eight thousand nine hundred and three, twelve, six hundred and thirty-nine, four thousand, 7243.
18. Twenty-three, two hundred and five, one thousand four hundred and sixty-six, 6999, eleven.
19. Seventy-nine, ninety-eight, a thousand and four, five hundred and eleven, ninety-one, twelve, three thousand and fifty-one, one hundred and three, seven.
20. Seventeen thousand and four, 5802, eleven thousand five hundred and thirty, four hundred thousand nine hundred and six, forty-five thousand, ninety-eight thousand and seventy.

F

1. There are 18 panes of glass in one window, 12 in another, 32 in another and nine in another; how many altogether?

2. In each of *five* schools there are 798 pupils, there are 566 in another and 1109 in the seventh. What is the total number of pupils in the 7 schools?

3. One tree has 457 apples, a second 59, a third 574 a fourth 1102. How many apples in all?

4. In a plantation there are 476 oaks, 1968 beeches, 4072 maples, 902 cedars, 127 elms, 97 white birches. How many trees altogether?

5. A book has 496 pages; how many pages would 4 such books have?

6. How many pens are there in 7 boxes, each containing 144?

7. A farmer has 479 sheep in one flock, 337 in another, 445 in another and buys 998; how many has he?

8. How many days are there in a year, if January has 31, February 28, March 31, April 30, May 31, June 30, July 31, August 31, September 30, October 31, November 30, December 31 days?

9. How many strokes does a clock telling the hours strike in 12 hours?

10. Find the sum of six hundred and seven, nine hundred and twenty-three, three thousand two hundred and six, fifteen thousand one hundred and nine, and twenty-one thousand one hundred and seventy.

11. There are nine sacks, each containing 197 potatoes; how many altogether?

12. The addends are 52478, 8365, 73719, 4006, 33411. Find the sum.

XX.

1. What is **subtraction?**

Ans. The process of finding the *remaining part* when the sum and one part are given.

2. How many numbers are there in subtraction?

Ans. Two only; the larger number (or sum) and the smaller number, which is to be subtracted.

3. What is the larger number called?

Ans. The **minuend.**

4. What is the smaller number called?

Ans. The **subtrahend.**

5. What is the answer found by subtraction called?

Ans. The **difference** or **remainder.**

A (*Sight*).

What number added to

1. 10 makes 25.
2. 20 makes 45.
3. 30 makes 69.
4. 40 makes 57.
5. 50 makes 71.
6. 8 makes 20.
7. 13 makes 30.
8. 28 makes 50.
9. 47 makes 80.
10. 14 makes 90.
11. 46 makes 80.
12. 67 makes 100.
13. 28 makes 36.
14. 36 makes 47.
15. 27 makes 42.
16. 29 makes 56.
17. 54 makes 63.
18. 34 makes 56.
19. 25 makes 93.
20. 69 makes 83.
21. 15 makes 70.
22. 54 makes 81.
23. 36 makes 73.
24. 26 makes 46.

B (*Sight*).

1. 79 – 19.
2. 40 – 18.
3. 50 – 16.
4. 37 – 14.
5. 48 – 15.
6. 54 – 16.
7. 58 – 38.
8. 64 – 25.
9. 72 – 34.
10. 64 – 48.
11. 58 – 49.
12. 94 – 77.
13. 81 – 65.
14. 97 – 49.
15. 66 – 27.

16. 51 − 37.	**21.** 96 − 18.	**26.** 92 − 48.
17. 74 − 48.	**22.** 39 − 26.	**27.** 43 − 26.
18. 78 − 34.	**23.** 51 − 23.	**28.** 78 − 36.
19. 73 − 34.	**24.** 85 − 14.	**29.** 94 − 27.
20. 86 − 29.	**25.** 71 − 34.	**30.** 66 − 23.

31. From 100 take the following numbers:—

39	46	39	17	28	55	64	85
54	37	24	65	44	37	28	79

C (*Sight*).

1. From 77 take 48.

2. Find the difference between 82 and 43.

3. Subtract 35 from 56.

4. What is left after taking 73 from 90?

5. How much is 81 greater than 19?

6. How much is 35 less than 89?

7. What must be added to 17 to make 82?

8. What must be taken from 60 to leave 11?

9. What number is less than 45 by 18?

10. The minuend is 70, the subtrahend 21: find the difference.

11. Take nineteen from one hundred.

12. 52 from 88 leaves how many?

13. What number must be taken from 63 to leave 28?

14. Thirty and what number make 43?

15. 14 tens from 17 tens leave how many?

16. From 90 take 23 twice.

17. From 40 take 9 four times.

18. From 50 take 8 continually until the remainder is less than 8.

19. From 100 take 15 continually until the remainder is less than 15.

XXI.

A

1. 78069 – 16736.
2. 86004 – 19363.
3. 69086 – 47979.
4. 59064 – 56899.
5. 63712 – 16019.
6. 58634 – 57016.
7. 45079 – 32048.
8. 33456 – 17748.
9. 65934 – 48566.
10. 90401 – 58270.
11. 502023 – 340647.
12. 670350 – 258961.
13. 900139 – 408075.
14. 605071 – 234567.
15. 830040 – 305607.
16. 910802 – 673005.
17. 671307 – 503008.
18. 534621 – 371823.
19. 193108 – 181109.
20. 400003 – 146327.

B

Find the difference between :—

1. 40061 and 389.
2. 735621 and 4695.
3. 490467 and 571324
4. 445566 and 616161.
5. 1968 and 601039.
6. 100300 and 7786.
7. 100100 and 3656.
8. 709600 and 46867.
9. 400000 and 345678.
10. 97497 and 876541.
11. 913472 and 35965.
12. 300000 and 8889.
13. 234569 and 345678.
14. 34998 and 295677.
15. 23233 and 323232.
16. 2222 and 22222.
17. 7777 and 999.
18. 1000000 and 999999.
19. 40061 and 389.
20. 273 and 700004.
21. 735621 and 4695.
22. 649 and 79201.
23. 571324 and 490467.
24. 550132 and 714028.
25. 112233 and 89765.
26. 17017 and 7071.
27. 120380 and 56738.
28. 6016 and 600060.
29. 250492 and 37989.
30. 100011 and 9009.

C

1. *From* one hundred and thirty-eight thousand five hundred and four *take* seventy thousand six hundred and ninety-nine.

2. What must be added to 590,395 to make 694,270?

3. What is left when $320.48 is taken from $562.67?

4. By how much is $285.47 greater than $159.30?

5. How much less is 500,000 than 923,570?

6. A man was born in 1853; what is his age in 1895?

7. A person speaking in 1895 says the battle of Waterloo took place 80 years ago; find the date of battle.

8. Out of a million people 30,630 die each year; how many remain?

9. Find the difference between thirty-one thousand three hundred and seventy *and* twelve thousand nine hundred and seventy-six.

10. A possesses $75,832 less than B, who has $395,427. How much has A?

11. How many years elapsed between the battles of Hastings in 1066 and Waterloo in 1815?

12. In a city containing 313,204 inhabitants, 160,837 are females. How many males are there?

13. In a park there are seven hundred and five trees; how many are left after one hundred and nineteen have been cut down?

14. How many have I left after taking four hundred and sixty thousand three hundred and eight *from* eight hundred thousand and sixty?

15. A measure contained 71,119 grains of corn; how many were left after 26,350 had been taken out?

16. Mount Everest is 29,000 feet high and Mount Blanc 15,731; what is the difference in their height?

XXII.

A *(for rapid dictation)*.

1. 23+4−5.
2. 31−7+8.
3. 25+9−6.
4. 38−8+7.
5. 36+7−9.
6. 19+8−9.
7. 28−9+3.
8. 21−5+8.
9. 17+6−7.
10. 82−3+9.
11. 18+6−7.
12. 93+8−7.
13. 65+6−5.
14. 70−3+5.
15. 45−6+8.
16. 6+9−4+7− 6−2.
17. 14−4+8−7+ 6−3.
18. 16−5+4−8+ 3+5.
19. 26+7−5+8−10+7.
20. 42−7+9−4+ 3−7.
21. 37− 8+ 7− 4+6−8.
22. 8+ 9−12+ 4−6+8.
23. 14− 6+ 8− 4+3−9.
24. 27+ 8− 9+10−7+6.
25. 19+11− 6+ 8−9+7.
26. 23−7+3−4+10−8+5−7+6.
27. 14+5−7+4−3+8−5+6+9−6.
28. 27−8+9−10+7−6−8+9+7−5.
29. 23−6+11−8+9−6+4−7+8.
30. 35+8−7+6−4+8−7+5−8+12.

B *(for silent work at sight)*.

1. 25+(9+6).
2. 38−(8+10).
3. 36−(9+7).
4. 52−(5+7).
5. 24−(7+8).
6. 17−(9+8).
7. 21−(5+4).
8. 18−(6+5).
9. 31−(8+6).
10. 29−(6+7).
11. (13+7)−8.
12. (15−9)+11.
13. (24+7)−13.
14. (52+9)−17.
15. (61+8)−22.
16. (56−9)+15.
17. (43−8)+52.
18. (19−5)+24.
19. (29−9)+47.
20. (16−5)+59.
21. (18+6)−(15+5).
22. (21+8)−(18+9).
23. (33+7)−(20+9).
24. (24−6)−(25−9).
25. (62+5)−(30−5).
26. (46−7)−(17+6).
27. 27−(8+3+7).
28. 40−(19+5−6).
29. 18−(17−6−3).
30. 50−(29−8−5).

C (*Sight*).

1. *From* 15 *take* the sum of 6 and 5.
2. *From* 50 *take* the difference between 20 and 10.
3. *To* 20 *add* the difference between 17 and 9.
4. *To* 23 *add* 6 and from the sum *take* 5.
5. *To* the sum of 35 and 7 *add* 8.
6. *To* the difference between 35 and 7 *add* 8.
7. *To* 29 *add* the difference between 11 and 7.
8. *From* the sum of 17 and 8 *take* the sum of 9 and 6.
9. *To* 19 *add* the difference between 8 and 5.
10. *From* the difference between 20 and 9 *take* the difference between 16 and 7.

D

1. *From* 8293 *take* the sum of 5032 and 805.
2. *From* 7869 *take* the difference between 2034 and 563.
3. *To* 563 *add* the difference between 1000 and 867.
4. *To* the sum of 345 and 807 *add* the difference between 563 and 279.
5. *From* the difference between 757 and 321 *take* 235.
6. *To* the difference between 1023 and 999 *add* the sum of 23 and 629.
7. *From* 39002 *take* twice 14307.
8. *From* the sum of 11, 1096, 2007, 855, 97 *take* the sum of 43, 108, 969, 2136, 384.
9. *From* 121314 *take* 3 times 10302.
10. *From* the sum of 51, 17, 93 *take* 69.
11. *From* 3 times 119 *take* 4 times 89.
12. By how much does 40169 exceed 4 times 2998?
13. *Add* together 591638 and 47958 and from the sum *take* thirty-four thousand one hundred and thirteen.
14. The minuend is 17265, the subtrahend 13167; find the remainder.

E

Find the missing addend :—

1.	2.	3.	4.	5.
4573	195	156	440	13765
2964	291	1288	2960	29568
1475	897	356	119	37654
....	...	....	....	.....
10000	1560	2000	3529	100000

6. The sum of four addends is 2369; three of the addends are 876, 295, 371. Find the fourth.

7. The sum of five addends is 167031; four of the addends are 9718, 47825, 39276, 4758. Find the fifth.

8. Subtract the sum of 296, 25, 21 from 1052.

9. Take the sum of 51, 256, 1006 from 3710.

10. 90,000 − (47,325 + 32,450 + 4896).

11. ($5278 + $340.58) − ($480.40 + $65.75).

12. (4850 + 6300) − (800 + 3285).

13. (1452 + 325 + 684) − (631 + 845).

14. The 3 volumes of a book contain 1592 pages. If the first contains 553 and the second 541, how many are there in the third ?

15. A father leaves $30,000 to his six children. Each of the five eldest gets $5119. What does the youngest get ?

16. In a school of 368 pupils, 93 are admitted and 79 leave during the year; how many remain ?

17. From a piece of silk measuring 301 yards the following lengths are cut :—16 yards, 11 yards, 11 yards, 18 yards, 15 yards, 13 yards, 13 yards, 16 yards, 17 yards, 17 yards, 24 yards, 23 yards, 29 yards, 34 yards What length remains ?

18. Mary has 1008 counters and John has 847; if Mary gives 222 to John, how many will each then have ?

XXIII.

NUMERATION TABLE.

MILLIONS.			THOUSANDS.			UNITS.		
Hundred mill.	Ten mill.	Millions.	Hundred thou.	Ten thou.	Thousands.	Hundreds.	Tens.	Units.
4	4	4	4	4	4	4	4	4
3d period.			2d period.			1st period.		

1. What is the name of the *third* period?

   Ans. The period of *millions.*

2. What 3 places does it occupy?

   Ans. The *seventh, eighth* and *ninth* places.

3. What is the value of a digit in the seventh place? In the eighth place? In the ninth place?

4. Read the number given above: 444, 444, 444.

5. Give the place-value of each digit in the number.

6. Write in figures:—

   Twenty-five millions, three hundred and sixty-one thousand, two hundred and seventy-five.

   Ten millions, five hundred thousand, six hundred and one.

   One million, thirty-six thousand.

   One hundred million, four thousand and six.

7. Point off into periods and read:—

7040602	13406759	604005003
50060405	60403001	6000005.

8. What is the *place-value* of 6 in each of the above numbers?

XXIV.

ELEVENS.

$11\times1=11$	$11\times7=77$	$11\div11=1$	$77\div11=7$
$11\times2=22$	$11\times8=88$	$22\div11=2$	$88\div11=8$
$11\times3=33$	$11\times9=99$	$33\div11=3$	$99\div11=9$
$11\times4=44$	$11\times10=110$	$44\div11=4$	$110\div11=10$
$11\times5=55$	$11\times11=121$	$55\div11=5$	$121\div11=11$
$11\times6=66$	$11\times12=132$	$66\div11=6$	$132\div11=12$

TWELVES.

$12\times1=12$	$12\times7=84$	$12\div12=1$	$84\div12=7$
$12\times2=24$	$12\times8=96$	$24\div12=2$	$96\div12=8$
$12\times3=36$	$12\times9=108$	$36\div12=3$	$108\div12=9$
$12\times4=48$	$12\times10=120$	$48\div12=4$	$120\div12=10$
$12\times5=60$	$12\times11=132$	$60\div12=5$	$132\div12=11$
$12\times6=72$	$12\times12=144$	$72\div12=6$	$144\div12=12$

12 things = 1 dozen: 12 months = 1 year: 12 inches = 1 foot.

1.

$121\div11=$	$132\div12=$	$12\times7=$
$60\div11=$	$72\div12=$	$12\times11=$
$29\div11=$	$96\div12=$	$12\times4=$
$105\div11=$	$80\div12=$	$12\times12=$
$132\div11=$	$108\div12=$	$12\times3=$

2. $\frac{1}{2}$ dozen = $\frac{1}{2}$ year = ——mos. 3 feet = ——inches.
$\frac{1}{4}$ dozen = $\frac{1}{4}$ year = ——mos. 6 feet and 4 inches =
2 dozen = 5 years = 2 feet and 9 inches =
8 dozen = 7 years and 2 mos. = one foot and a half =
10 dozen = 9 years and 8 mos. = 4 feet and 7 inches =

3. Multiply 60389, 70895, 63809, 87632 and 909009, each separately by 11 and 12.

4. Divide 732107, 11988959, 11010989, 76011101 and 108121198, each separately by 11 and 12.

XXV.

Multiplication is a short method of *adding a number to itself.*

In multiplication there are *two* numbers, called *multiplicand* and *multiplier.*

The **multiplicand** is the number that is to be *added to itself* or multiplied.

The **multiplier** *shows how many times* the multiplicand is to be added to itself.

The **product** is the result found by multiplication.

The multiplicand and multiplier are called **factors.**

The *sign of multiplication* is ×. It may be read "*times,*" or "multiplied by." Thus :—

(7 × 5 is read "7 times 5" or "7 multiplied by 5.")

A (*Sight*).

1. 30×7.	16. 21×6.	31. 74×8.	46. 3× 4×5.
2. 70×3.	17. 54×2.	32. 59×6.	47. 4× 6×5.
3. 40×9.	18. 43×3.	33. 84×7.	48. 6× 7×2.
4. 90×4.	19. 81×7.	34. 39×7.	49. 8×10×5.
5. 70×6.	20. 31×9.	35. 42×9.	50. 7× 3×6.
6. 60×7.	21. 18×5.	36. 19×8.	51. 3× 6×7.
7. 80×5.	22. 13×6.	37. 91×6.	52. 2× 7×6.
8. 70×7.	23. 16×4.	38. 32×6.	53. 6×12×3.
9. 90×8.	24. 26×6.	39. 47×7.	54. 8× 5×7.
10. 80×9.	25. 17×5.	40. 96×5.	55. 2×11×8.
11. 80×7.	26. 67×2.	41. 78×9.	56. 11× 3×4.
12. 70×9.	27. 95×5.	42. 59×9.	57. 5× 5×5.
13. 90×9.	28. 68×5.	43. 64×7.	58. 6× 6×6.
14. 80×6.	29. 83×4.	44. 48×8.	59. 7× 7×7.
15. 50×5.	30. 86×4.	45. 98×6.	60. 8× 8×8.

B

What two numbers multiplied together will make

22	15	28	35	49	24	54	81	16	18
25	48	42	32	63	72	56	45	108	132

What are the *factors* of

28	27	21	36	18	96	40	64	49	144
54	14	30	50	77	60	55	84	121	132

Multiply at sight, using factors:—

1. 7×15.	5. 11×15.	9. 13×14.	13. 26×32.
2. 6×14.	6. 4×18.	10. 23×18.	14. 13×42.
3. 12×16.	7. 5×25.	11. 28×15.	15. 23×27.
4. 11×14.	8. 6×22.	12. 17×21.	16. 80×24.

Multiply, using factors:—

1. 834 by 15.	8. 40563 by 56.	15. \$2908.16 by 16.
2. 586 by 22.	9. 96428 by 66.	16. \$9732.18 by 18.
3. 7019 by 32.	10. 54239 by 72.	17. \$9543.28 by 21.
4. 3607 by 45.	11. 68432 by 15.	18. \$7183.95 by 28.
5. 8623 by 24.	12. 97841 by 80.	19. \$4561.03 by 32.
6. 5843 by 63.	13. 35621 by 24.	20. \$6798.45 by 84.
7. 6264 by 70.	14. 78428 by 36.	21. \$3820.79 by 72.

22. Divide 79546 by 18, using factors.
23. Divide 507340 by 28, using factors.
24. Divide 670408 by 35, using factors.
25. Divide \$427.68 by 132, using factors.
26. Divide \$236.46 by 42, using factors.

Divide, using factors:—

27. 3916476 separately by 16, 25, 35, 81, 56.
28. 8213964 separately by 15, 18, 24, 14, 36.
29. 2156903 separately by 49, 72, 84, 110, 50.
30. 5713860 separately by 21, 54, 99, 63, 108.
31. 8414948 separately by 42, 66, 81, 144.

XXVI.

A (*Sight*).

1.	16×10.	23×10.	54×10.	49×10.
2.	64×10.	89×10.	19×10.	88×10.
3.	7×10.	7×100.	13×10.	13×100.
4.	21×100.	37×100.	48×100.	51×100.
5.	21×1000.	37×1000.	48×1000.	51×1000.
6.	31×10.	31×20.	31×30.	31×40.
7.	9×10.	9×50.	9×60.	9×70.
8.	13×20.	13×80.	13×90.	13×100.

9. How do you multiply a number by 10?

Ans. You place a *cipher* at the right of the number *in the units' place.*

10. What is the effect of this?

Ans. It increases each figure *ten-fold*, by raising it to the *next higher place.*

11. How do you multiply a number by 100? by 1000?
12. How do you multiply a number by 50? by 500?
13. How do you divide a number by 10? by 50?

B

Multiply and prove by division:—

1.	85×50.	5. 59×300.	9. 463×40.
2.	73×80.	6. 76×200.	10. 214×50.
3.	92×60.	7. 85×700.	11. 356×70.
4.	54×90.	8. 26×800.	12. 343×80.

Multiply (*a*) showing full steps, (*b*) by shorter method:—

13.	14×13.	16. 476×53.	19. 123×222.
14.	21×23.	17. 598×42.	20. 345×333.
15.	46×31.	18. 296×37.	21. 621×234.

C

Find the products of the following numbers:—

1. 55×32.
2. 75×35.
3. 13×13.
4. 25×25.
5. 46×46.
6. 78×78.
7. 425×34.
8. 895×17.
9. 439×26.
10. 125×34.
11. 791×86.
12. 907×38.
13. 2576×43.
14. 4392×58.
15. 7054×69.
16. 8679×23.
17. 99706×73.
18. 46054×78.
19. 46054×68.
20. 921939×89.
21. 5678×134.
22. 3465×271.
23. 19579×123.
24. 19579×345.
25. 75060×914.
26. 98653×557.
27. 26108×357.
28. 81037×946.
29. 95738×671.
30. 37563×452.

D

Find the products of the following numbers:—*

1. 31×10.
2. 56×100.
3. 89×1000.
4. 890×100.
5. 27×20.
6. 2700×20.
7. 789×5000.
8. 567×110.
9. 4086×30000.
10. 85607×900.
11. 841875×20.
12. 107752×400.
13. 97841×80.
14. 1920×2000.
15. 540×700.
16. 4300×60.
17. 12000×31.
18. 3700×32.
19. 8120×46.
20. 4376×2500.
21. 50634×41000.
22. 5630×640.
23. 6230×890.
24. 56380×720.
25. 352×2300.
26. 9800×9700.
27. 5079×760.
28. 9508×870.
29. 7680×870.
30. 4310×370.
31. 6055×2900.
32. 92510×830.
33. 832194×107.
34. 425734×206.
35. 904861×308.
36. 471839×403.
37. 574283×709.
38. 448792×805.
39. 69587×6050.
40. 93285×3007.
41. 78134×4700.
42. 97209×4009.
43. 9244×5008.
44. 9538×8007.
45. 2964×3092.
46. 3208×4703.
47. 4873×4056.
48. 81321×13009.

* Examples 1–16 to be proved by short division.

XXVII.

A (*Sight*).

Which is the greater, and by how many:—

1. 3 nines or 4 sevens?
2. 4 nines or 12 threes?
3. 7 sevens or 12 fours?
4. 8 eights or 7 nines?
5. 10 fours or 5 eights?
6. 5 fours or 10 twos?
7. 5 fives or 8 threes?
8. 10 tens or 11 nines?
9. 9 nines or 12 sevens?
10. 8 eights or 11 sixes?
11. 7 fives or 11 threes?
12. 11 elevens or 12 tens?
13. 10 fives or 7 sevens?
14. 11 nines or 12 eights?

B (*for dictation*).

1. To 5 add 3, add 4, multiply by 6.
2. To 12 add 7, multiply by 4.
3. Multiply 7 by 8, add 20.
4. Multiply 11 by 12, add 30.
5. To 13 add 7, subtract 5, multiply by 2, subtract 15, subtract 10, multiply by 3, subtract 8.
6. From 15 subtract 9, multiply by 3, subtract 8, add 2, multiply by 2, subtract 20, add 8, multiply by 9.
7. Add 7 to 9, subtract 6, multiply by 4, subtract 20, add 7, subtract 5, multiply by 2, add 9.
8. To 19 add 11, subtract 15, multiply by 2, subtract 18, multiply by 6.
9. Add 6 to 18, subtract 9, multiply by 4, subtract 25.
10. From 19 take 8, multiply by 6, add 7, subtract 20.
11. To the product of 8 by 8, add 6, subtract 30, add 7.
12. Multiply 7 by 6, subtract 12, add 4, subtract 14.
13. To 7 add 8, add 9, subtract 3, multiply by 5.
14. Multiply 4 by 4, add 12 twelves.

C (*Sight, with oral statement*).

1. If 5 men can do a job in 10 days, how long will it take one man?

(*Oral Statement.*—It will take 1 man 5 times as long as 5 men; and 5 times 10 days are 50 days.)

2. 6 men can mow a field in 8 days; how long will it take one man to do the work?

3. It takes 9 men 9 days to dig a trench; how long will it take one man?

4. A ton of hay will last 7 cows 9 days; how long will it last one cow?

5. If 9 men can build a shed in a week, how long will it take one man?

6. Four pipes of equal size can fill a tank in 7 hours; in how many hours can one of them fill it?

7. What will 4 tons of iron cost at $30 a ton?

8. A train travels at the rate of 40 miles an hour; how far will it go in 7 hours?

9. From 25 yards of cloth 13 yards are cut; what is the remainder worth at $5 a yard?

10. A man's wages are $15 a week, and he spends $7 a week; what will he save in 6 weeks?

11. A farmer bought 4 cows for $50 each and sold them for $45 each; how much did he lose?

12. Cost of 7 acres of land at $14 an acre?

13. Cost of 8 horses at $25 each?

14. Cost of 10 waggons at $64 each?

15. 11 pieces of silk, each containing 23 yards?

16. 500 men in a company; how many in 10 companies?

17. Mary gains 5 marks a day and Arthur 6 marks; how many will they both gain in a week?

18. Apples 2 cents each; pears 4 cents; cost of 8 of each?

D

1. If an acre of land contains 4840 square yards, how many yards in 17 acres?

2. How far will a train running 45 miles an hour go in 9 hours, if one hour is lost in stoppages?

3. What is the weight of 18 cars each weighing 14 tons, and an engine weighing 65 tons?

4. A man spends $15 a day; how much does he spend in a year of 365 days?

5. In a flock of 675 sheep how many feet were there?

6. If a pound of sugar costs 5 cents, what will 243 pounds cost?

7. If a ton of coal costs $6.30, what will 90 tons cost?

8. 30,000 seeds have been counted in a single poppy; how many seeds would be found in 900 such?

9. 9,000,000 eggs have been found in a single fish; how many would there be in 40 such?

10. One city contains 37,294 people; another city contains four times as many. How many people are there in the larger city?

11. A fisherman caught 30,724 mackerel and three times as many herrings. How many fish did he catch altogether?

12. Harry had 29 marbles, Dick twice as many, and Joe three times as many; how many altogether?

13. What would be the weight of 5958 boxes, each weighing 486 ounces?

14. How many pages in 9080 books, if each book has 90 pages?

15. How many bricks will be required to build 154 houses, if each requires 3000 bricks?

XXVIII.

Division is finding *how many times* one number is contained in another; or separating a number into *equal parts.*

In division there are two numbers, called *dividend* and *divisor.*

The **dividend** is the number to be divided.

The **divisor** is the number by which we divide.

The result or answer found by division is called the **quotient.**

The part of the dividend *left after dividing* is called the **remainder.**

The *sign* of division is ÷ and is read *"divided by."*

A

1. 403÷31.
2. 615÷41.
3. 816÷51
4. 1281÷61.
5. 1136÷71.
6. 1863÷81.
7. 2002÷91.
8. 169÷13.
9. 611÷13.
10. 310÷13.
11. 7865÷23.
12. 8453÷62.
13. 897÷23.
14. 8257÷43.
15. 9567÷43.
16. 9275÷17.
17. 5219÷93.
18. 2494÷29.
19. 3626÷37.
20. 8253÷47.
21. 6893÷82.
22. 5985÷47.
23. 3378÷13.
24. 9034÷17.
25. 3378÷17.
26. 1431÷53.
27. 1520÷38.
28. 9282÷26.
29. 5276÷83.
30. 2623÷43.
31. 9399÷19.
32. 3005÷31.
33. 5100÷95.
34. 7777÷83.
35. 67569÷21.
36. 88763÷32.
37. 47839÷42.
38. 75043÷52.
39. 93840÷63.
40. 31278÷73.
41. 96802÷29.
42. 96802÷37.
43. 55005÷13.
44. 25031÷46.
45. 30597÷58.
46. 11414÷26.
47. 29822÷31.
48. 43896÷93.
49. 57810÷94.
50. 45567÷37.
51. 23456÷28.

B

1. 6355 ÷ 31.	11. 14800 ÷ 37.	21. $708.50 ÷ 65.
2. 67359 ÷ 21.	12. 2730 ÷ 39.	22. $641.28 ÷ 32.
3. 6035 ÷ 58.	13. 26521 ÷ 53.	23. $253.80 ÷ 54.
4. 40095 ÷ 38.	14. 536008 ÷ 67.	24. $841.40 ÷ 28.
5. 102816 ÷ 17.	15. 419150 ÷ 83.	25. $4889.40 ÷ 87.
6. 39702 ÷ 13.	16. 694830 ÷ 69.	26. $4131.77 ÷ 59.
7. 23374 ÷ 58.	17. 365400 ÷ 57.	27. $4832.07 ÷ 69.
8. 76670 ÷ 95.	18. 321485 ÷ 98.	28. 2370056 ÷ 79.
9. 68999 ÷ 98.	19. 75576 ÷ 47.	29. 470476 ÷ 47.
10. 8568 ÷ 17.	20. 70380 ÷ 69.	30. 92483 ÷ 46.

C

1. 3552 ÷ 101.	20. 917683 ÷ 496.
2. 37055 ÷ 103.	21. 342216 ÷ 579.
3. 111011 ÷ 101.	22. 454479 ÷ 652.
4. 910372 ÷ 101.	23. 375426 ÷ 521.
5. 92191 ÷ 107.	24. 920005 ÷ 921.
6. 35000 ÷ 705.	25. 925650 ÷ 916.
7. 92005 ÷ 809.	26. 20005 ÷ 1003.
8. 294763 ÷ 306.	27. 3755123 ÷ 1001.
9. 3560325 ÷ 904.	28. 5405405 ÷ 1001.
10. 7075 ÷ 123.	29. 19132 ÷ 9001.
11. 59248 ÷ 123.	30. 900512 ÷ 5013.
12. 1056007 ÷ 234.	31. 30156 ÷ 3791.
13. 280501 ÷ 345.	32. 92005 ÷ 2915.
14. 51846734 ÷ 102.	33. 1000000 ÷ 3007.
15. 727346489 ÷ 408.	34. 321586 ÷ 5063.
16. 73107529 ÷ 107.	35. 2030405 ÷ 4725.
17. 62346 ÷ 254.	36. 4372851 ÷ 6104.
18. 70893 ÷ 532.	37. 3755123 ÷ 9089.
19. 18146 ÷ 683.	38. 930056 ÷ 8152.

XXIX.

A

Division is a *short method of subtracting.*

In the following subtract the subtrahend successively from the minuend until the remainder (if any) is less than the subtrahend. *Prove by division:*—

1. 69 − 23.
2. 67 − 14.
3. 78 − 25.
4. 68 − 17.
5. 567 − 189.
6. 792 − 261.
7. 801 − 158.
8. 913 − 297.
9. 1000 − 199.
10. 6002 − 1808.
11. 8552 − 2138.
12. 9018 − 3556.

B

Division is the reverse of multiplication.

Divisor × *quotient* (+ *remainder*) = *dividend.*

Product ÷ *one factor* = *other factor.*

Definition: Division is the process of finding the other factor, when the product and one factor are given.

Work the following and prove each by the reverse method:—

1. Divisor 27, quotient 42. Required dividend.
2. Divisor 83, quotient 741. Required dividend.
3. Divisor 74, quotient 305, rem. 23. Req. dividend.
4. Divisor 57, quotient 628, rem. 49. Req. dividend.
5. Quotient 201, divisor 3007, rem. 150. Req. dividend.
6. Quotient 758, divisor 8234, rem. 89. Req. dividend.
7. Product 918, one factor 6. Required other factor.
8. Product 4239, one factor 23. Req. other factor.
9. Product 7654, multiplier 57. Req. multiplicand.
10. Product 84317, multiplier 67. Req. multiplicand.
11. Product 74306, multiplicand 31. Req. multiplier.
12. Product 96432, multiplicand 781. Req. multiplier.

XXX.

A (*Sight, with oral statement.*)

1. 12 inches make a foot. How many feet in 48 in. ?

(*Oral Statement.*—As many feet as there are 12's in 48, or 4 ft.)

2. How many barrels of pears at $8 can be bought for $96 ?

3. How many 5-cent pieces in a dollar ?

4. How many dozens in 72 ?

5. How many half-dozens in 60 ?

6. 36 boys and 44 girls. How many groups of 20 children each ?

7. The product of two numbers is 144, and one of them is 6 ; what is the other ?

8. The quotient is 15, the divisor 5, find the dividend.

9. How many times can 7 be taken from 77 ?

10. How many times can 9 be taken from 60, and what will remain ?

11. The quotient is 8, the divisor 13 and the remainder 5 ; what is the dividend ?

12. The dividend is 150 and the quotient 15 ; what is the divisor ?

13. 9 times Mary's age is 81 ; find her age.

(Mary's age is $\frac{1}{9}$ of 81 years, or 9 years.)

14. What is the rent per acre, if 13 acres rent for $65 ?

15. In how many hours can 6 men do a piece of work that takes one man 66 hours ?

16. How long will a quantity of oats last 3 horses, if it will last one horse for 93 days ?

17. If a train runs 117 miles in 9 hours, what is the rate per hour ?

B

1. In a year there are 52 weeks; how many years are there in 1640 weeks?

2. If it takes 18 yards of silk to make a dress, how many dresses can be made from 1350 yards?

3. A man bought 95 horses for $4750; how much did he give for each?

4. If a man travels 45 miles a day, how long will it take him to travel 1215 miles?

5. A grocer packed 18,144 eggs in boxes holding 144 eggs each; how many boxes did he use?

6. If he had packed the same eggs in 63 boxes, how many eggs would he have put in a box?

7. A confectioner sells 23,475 buns in 313 days; how many does he sell in a day?

8. If each car contains 57 passengers, how many cars are there in a train carrying 969 passengers?

9. A place is visited by 5380 people in 55 days; how many go there in a day? How many in a week?

10. 2793 tons of coal are distributed equally amongst 57 families; what does each family get?

11. How many boxes, each containing 39 oranges, would be required to hold 296,790 oranges?

12. If 17 workmen are paid $10,778, what sum does each receive?

13. At $46 an acre, how much land can be bought for $2,906,400?

14. Dividend 817,200, divisor 90. Required the quotient?

15. What is the 24th part of $19,296?

16. How many dozens are there in 879,576 bottles?

17. Find the 48th part of 477 times 192.

TIME.

(*See dial of clock, p. 41.*)

1. When the minute-hand has made one revolution on the dial, how much time has passed?

2. When the hour-hand has made one revolution, how much time has passed?

3. How many times does the minute-hand move round while the hour-hand is moving round once?

4. How many times does the hour-hand pass XII in one day? How many times the minute hand?

5. Into how many parts is the small circle on the dial divided?

6. How long does it take the second-hand to pass over one division? How many seconds in one minute?

7. There are

30 min. in——hour.	60 sec. in——min.
120 min. in——hours.	30 sec. in——min.
30 min. in——hour.	——sec. in 5 min.
15 min. in——hour.	——sec. in $2\frac{1}{2}$ min.

8. There are

——hours between 2 P.M. and 7 P.M.
——hours between 9 A.M. and 12 M.
——hours between 11 A.M. and 6 P.M.
——min. between 7.5 A.M. and 7.40 A.M.
——min. between 10 P.M. and 11.30 P.M.
——min. between 11.30 A.M. and 12.45 P.M.

9. How many days in each of the 12 months?
10. How many days in a year?
11. How many days in the 3 spring months?
12. How many days in the 3 summer months?
13. How many days in the 3 autumn months?
14. How many days in the 3 winter months?

CAPACITY.

Draw a picture of a pint, a quart and a gallon measure. (See page 42.)

A quart is——times as large as a pint.

A gallon is——times as large as a quart.

1 bushel. ½ bushel. 1 peck. ½ peck.

A peck measure holds 8 quarts.

A bushel measure holds 4 pecks

1. How many times must you fill the quart measure to make a peck? ½ peck? 2 pecks?

2. How many times must you fill the peck measure to make a bushel? ½ bushel? 3 bushels?

3. How many quarts make a gallon? 7 gallons?

4. How many quarts make a peck? 7 pecks?

5. How many pints in 5 quarts? 2 quarts and 1 pint?

6. Which is more: one bushel or 3 pecks? One peck or 9 quarts? 2 gallons or 8 quarts? 3 quarts or 5 pints?

7. Name 5 liquids that are measured by the pint, quart and gallon; and 5 things (not liquids) that are measured by the quart, peck and bushel.

8. How many

quarts in 5 pecks?	quarts in 3 gal. 2 quarts?
pecks in 32 quarts?	pecks in 3 bushels 2 quarts?
bushels in 20 pecks?	quarts in 15 pints?
pecks in 20 bushels?	gallons in 15 quarts?

9. Cost of a peck of currants at 5 cents a quart?

10. Cost of ½ peck of strawberries at 8 cents a quart?

11. Cost of 1 peck 2 quarts of chestnuts at 10 cents a quart?

MEASUREMENTS.

1. What object in the school-room is a yard long? A foot long? An inch long?

2. How many inches in a foot? Feet in a yard?

3. Estimate in feet the height and width of the door of your school-room; one of the windows; the blackboard.

4. Estimate in yards the length and width of the floor.

5. What building or street or place is about a mile from the school? (1760 yards are one mile.)

6. How long does it take you to walk a mile?

7. How many

inches in 1 foot? 4 feet? 3 feet?
feet in 1 yard? 2 yards? 5 yards?
inches in 1 yard? 2 yards? 3 yards?
feet in 12 inches? 36 inches? 60 inches?
yards in 3 feet? 6 feet? 12 feet?
yards in 36 inches? 18 inches? 72 inches?
yards in 1 mile? $\frac{1}{2}$ mile? $\frac{1}{10}$ mile?

8. A room is 9 yards long. How many feet?

9. How many inches in a foot and a half?

10. I wish to buy 30 inches of gold braid. Is this more or less than a yard?

11. 12 inches are cut from a piece of silk 2 yards long; how many feet are in the part left?

12. A rug is 5 feet 6 inches long. How many inches long is it? How many inches more does it need to make it 2 yards long?

13. One-third of a foot wants how many inches to make a foot?

14. A freight train travels 66 miles in 3 hours; how many miles does it run in an hour?

15. Cost of 3 yards of ribbon at 4 cents a foot?

WEIGHT.

1 pound. 1 ounce.

16 ounces make a pound.

1. Give a list of 5 articles that are bought and sold by the pound, and give the price of each.
2. Write the abbreviations for ounce and pound?
3. How many

oz. in 2 lbs.?	lbs. in 32 ounces?
oz. in $\frac{1}{2}$ lb.?	lbs. in 64 ounces?
oz. in 4 lbs.?	lbs. in 24 ounces?
oz. in $4\frac{1}{2}$ lbs.?	lbs. in 40 ounces?

4. What part of a lb. is 8 ounces? 4 ounces?
5. Cost of a lb. of candy at 2 cents an oz.?
6. Cost of $\frac{1}{2}$ lb. of sugar at 8 cents a lb.?
7. A grocer put 42 lbs. of raisins into six equal parcels. How many lbs. in each parcel? What part of the whole did each parcel contain?

ROMAN NOTATION.

13	XIII	19	XIX	50	L
14	XIV	20	XX	60	LX
15	XV	21	XXI	70	LXX
16	XVI	22	XXII	80	LXXX
17	XVII	30	XXX	90	XC
18	XVIII	40	XL	100	C

Write in Roman notation: 5, 9, 10, 14, 19, 26, 31, 42, 53, 65, 77, 88, 99.

SIGHT EXERCISES.

1. From the sum of 6, 3, 5 and 12 take 13.
2. In 6 bags of 12 apples each how many nines?
3. How many dozen in 9 times 8?
4. To 7 times 8 add 7 times 3.
5. What is left when 19 is taken from 65?
6. Multiply 3 times 3 by 4 times 2.
7. How many must be added to 16 to make 27+9?
8. Add 9 times 9 to the sum of 7, 3 and 9.
9. How many sevens in the sum of 12, 10, 11, 6, 3?
10. From 11 times 11 take 9 times 9.

---

1. How many must be taken from 44 to leave 4+9?
2. How many must be taken from 38 to leave 5 times 3?
3. In 48 how many half-dozen?
4. In 12+11+10+9+8 how many tens?
5. How many eights in 6+12+8+4+2?
6. How many must I add to 60 to give 5 boys 13 each?
7. Take $\frac{1}{2}$ of 40 from $\frac{1}{3}$ of 90.
8. From 40 marbles I lost 9, gave away 8. What left?
9. Divide 8 dozen marbles among 16 boys.
10. Divide 1100 nuts among 100 girls.

---

1. What number is one-fourth of 12?
2. Difference between $\frac{1}{2}$ of 12 and $\frac{1}{3}$ of 15.
3. What must I take from 20 to get 9?
4. What must I add to 6 times 4 to get 40?
5. 3+4+5+6+7 lacks how many of 50?
6. How much is (3×2)+(3×2) less than 20?
7. Divide 143 oranges among 13 children.
8. How many sixes in 8+5+6+6?
9. Add 7 times 9 to 4 times 6.
10. Multiply 2 fours by 3 fours.

1. $5 \times 6 \times 4$.
2. Multiply $5+6$ by 11.
3. From $8+9+7$ take 15.
4. Take 15 from 79.
5. One-twelfth of 144.
6. Divide 9 times 8 by 6.
7. Add 14, 7, 21, 42.
8. Take 9 from 7 times 6.
9. Add 6 eights to 4×3.
10. 7 for 4 cents. Cost of 1?

1. $20+(3 \times 4)$.
2. 9 times $(6+4)$.
3. $17+(15 \div 3)$.
4. $18+(6 \times 7)$.
5. 9 times $(24 \div 8)$.
6. $(3 \times 5)+18$.
7. $(8-6) \times 7$.
8. $(16-7) \times 3$.
9. $(25 \div 5) \times 8$.
10. $(6 \times 4)-18$.

1. From 45 take $7+4+6$.
2. From 9×8 take 5×4.
3. To 9×5 add 5×5.
4. Multiply $7+5$ by 10.
5. From 10×11 take 50.
6. Multiply $7+5$ by $8+3$.
7. To 0×5 add 7.
8. $5 \times 4 \times 0$.
9. $6 \times 5 \times 5$.
10. 9 times $4+5$.

1. $(6 \times 7)-(4 \times 5)$.
2. $(8 \times 4) \div (15-7)$.
3. $(12 \div 4) \times (7-6)$.
4. $(7 \times 5)+(12 \div 6)$.
5. $(72 \div 9) \times (22-10)$.
6. $(64 \div 8)-(16-8)$.
7. $(96 \div 8) \times (9 \div 3)$.
8. $(60-15) \div (14-9)$.
9. $(9 \times 6)+(5 \times 5)$.
10. $(7 \times 9)-(6 \times 6)$.

1. Take $13+12$ from 30.
2. $10 \times 3 = 6$ times——?
3. How many twos in 50?
4. $\frac{1}{5}$ of 55.
5. $72 \div 8$.
6. 7 five-cent pieces?
7. 3 25-cent pieces?
8. How many halves in 12?
9. How many dozen in 60?
10. 6 twelves less 15?

1. $31-9+(6 \times 3)$.
2. $(63+9) \div 12$.
3. $(49+14) \div (28-19)$.
4. $(48+36) \div (48-36)$.
5. $5 \times (13-6)+5$.
6. $5 \times (13-6+5)$.
7. $5 \times 13-(6+5)$.
8. $5 \times (13+6+2)$.
9. $8 \times (7-5)-(16-2)$.
10. $3 \times (7-5) \times (6+5)$.

MENTAL PROBLEMS (*with oral analysis*).

1. A gentleman divides 15 apples among some children, giving the first child 3 apples and the others 2 apples each. How many children were there?

2. Two sparrows lit upon a tree, and then 2 more, and then 3, and then 3, and then 2×2. $3+4+5$ soon flew away. How many remained?

3. A number of oranges was divided among 5 children according to age, so that each older got one orange more than the next younger. The middle child in age got 3 oranges. How many did each of the others get? How many oranges were distributed?

4. Four brothers divided 17 cents so that the oldest had one more than the others. How many did each get?

5. 23 cents were divided equally among 4 poor children. How many did each get and how many were left?

6. Baby is 18 months. How many years old is baby?

7. "My little brother," said Mary, "is $2\frac{1}{2}$ years old;" "And mine," said Bertha, "is just one month older." How many months old was Bertha's brother?

8. A board is 20 inches long; how much must be sawn off to leave exactly a foot?

9. James is 20 years old: he has a brother 3 years younger, and a sister 6 years younger than his brother. How old is his sister?

10. In the morning there were 19 boys and 21 girls at school; in the afternoon one-fifth of them stayed away. How many were present in the afternoon?

---

1. A piece of cloth measures 25 feet. How many yards does it contain?

2. How many weeks in 50 days?

3. Charles has a cane 2 feet 6 inches long. How many inches long is it?

4. A farmer sold 3 sheep at $5 each, and 4 pigs at $3 each. How much did he lack of getting $30?

5. A teacher divided 40 apples among his pupils, giving the boys half and the girls half. The boys received each 4 apples and the girls each 5. How many pupils?

6. I spend $50 for coal at $4 a ton; how many tons do I buy?

7. January has 31 days, February 28 and March 31. How many days short of 100?

8. A farmer sold 4 cows at $25 each, and spent the money on sheep at $5 each. How many sheep did he buy?

9. Mrs. A has 8 dozen eggs. How many does she require to have 100 eggs?

10. From 4 dozen pears one-half are eaten, then half the remainder, then 5. How many remain?

---

1. One sum worked in 3 min. How many in an hour?

2. How many days in seven weeks?

3. $\frac{1}{4}$ of a flock of 60 sheep died. How many left?

4. How many minutes from 20 to 11 till 5 to 12?

5. I take 3×5 from a number and get 5×3 as remainder. What is the number?

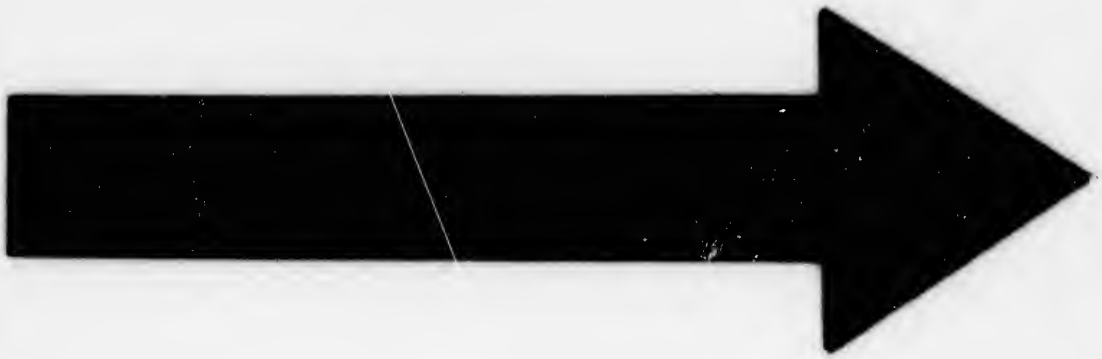
6. Cost of one dozen and two pencils at 2 cents each.

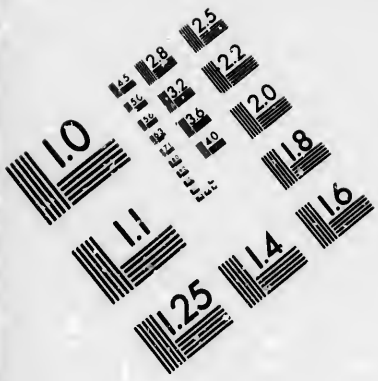
7. Tom gives three-quarters of an hour to his home lessons each day: 20 minutes at night and the rest in the morning. How many min. in the morning does he give?

8. Fanny has 2 five-cent pieces, a twenty-five-cent piece and one cent. She buys lead pencils at 4 cents each. How many does she buy?

9. 6300 letters posted a week. How many each day?

10. How many feet have 9 horses, 3 dogs and 5 boys?





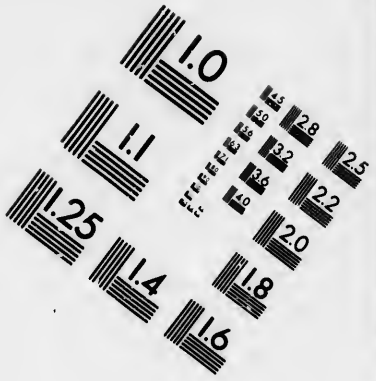
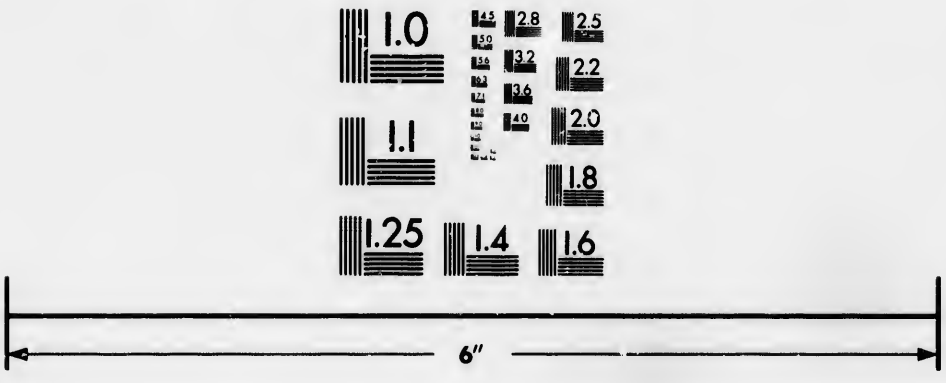
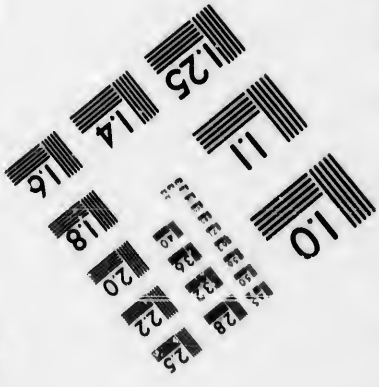


IMAGE EVALUATION TEST TARGET (MT-3)





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2.0
1.8
1.1
1.0

REVIEW EXAMPLES.

1

1. Find the number of soldiers in an army of six regiments that contain 895, 976, 884, 937, 949 and 982 men respectively.

2. A plum tree had eleven thousand and fifty plums on it; nine hundred and eighty-seven were spoiled in gathering; how many remained good?

3. I buy a piano for $468, agreeing to pay $12 a month until the whole should be paid. How many payments have I to make? How many years and months before the whole is paid?

4. The factors are 456 and 311; find the product.

2

1. Subtract 7 times 7654 from 56131.

2. In 3 bags there are 2000 counters. In the first there are 190; in the second there are 740 more than in the first. How many counters are in the third bag?

3. How many weeks and days are there in the first and last months of the year?

4. The quotient is 295, the divisor 322, the remainder 59; find the dividend.

3

1. How many apples in six dozen, one hundred and fifteen, fifty-nine, and one hundred apples?

2. $1000-(13+101+110)$.

3. From the sum of 5367, 1926, 899 take 4791, and divide the remainder by 13.

4. Divide 30,401 by 301 and multiply the result by 399.

4

1. Subtract $43219+865974+7658$ from one million.

2. Multiply $(81442 \div 86)$ by $43+18+21$.

3. The attendance at a school was 946 on Monday, 819 on Tuesday, 920 on Wednesday, 897 on Thursday, and 888 on Friday. What was the total number for the five days?

4. How many times does the clock strike in 24 hours?

5

1. How many days in the last 8 months of the year?

2. An army consists of 11 regiments, 5 of which are 897 strong, and 6 are 939 strong. How many soldiers are there in the army? (Work by two methods.)

3. The quotient is 451, the dividend 38,350, the remainder 15. Find the divisor.

4. Tom had 100 marbles: if he had 8 more he would have exactly six times as many as the half of what his brother has. How many has his brother?

6

1. Find the sum, the difference, the product and the quotient of 667 and 29. Add together the four results.

2. A farmer sold 37 geese at 70 cents each, and 27 turkeys at $1.10 each. How much more did he get for turkeys than for the geese?

3. A farmer sold 93 lambs: he sold 41 of them at $3 each and the rest at $2 each What did he receive?

4. A farmer sold 11 cows at $23 each, and bought 5 horses at $29 each. How much money had he over?

7

1. $3674-(8\times449)$.

2. Find the continued product of $83\times7\times6\times5$.

3. I have a bag of 3456 counters; if I deal them out giving one counter in turn to each of 43 persons, till all the counters are distributed, how many will each person get?

4. A man plants 20 acres of ground with trees; on each acre there are 11 rows of trees, with 22 trees in each row; how many trees did he plant?

8

1. If 2131 apples are divided equally among 53 boys, how many does each boy get?

2. 2131 apples are divided so that each boy gets 53 apples; how many boys get a share?

(What is the difference between these two examples?)

3. Divide $\frac{1}{2}$ of 906138 by $\frac{1}{5}$ of 10825.

4. What number must be added to 3741 to make 5000?

9

1. A merchant bought 39 bales of goods at \$36 a bale and sold them again at \$42. How much did he make?

2. A gardener worked a week (six days) in a garden and received \$9.60. How much did he get daily?

3. How many hours do you go to school in the forenoon? How many minutes?

4. A vine grows 2 inches in a day; how many feet will it grow in 3 weeks?

5. How many minutes from 10 A.M. to 4 P.M.?

6. \$3600 is to be divided among 3 persons. The first is to receive $\frac{1}{6}$ of it, the second $\frac{1}{4}$ of it, and the third the remainder. How much will each receive?

10

Supply numbers in the following examples and work:—

1. February has —— days; March has —— days; April has—— days. How many days have the 3 months together?

2. We are in school——hours in the morning. We have——minutes for opening exercises and——minutes for recess. How many minutes have we for lessons?

3. At——minutes before 8 o'clock where do the hour and minute-hand hands of a clock point?

4. I bought a dozen peaches at the rate of——for ——cents. How much did they cost?

5. If——pints of milk are used every day, how many quarts will be used in a week?

6. I use——ounces of coffee a day. How many pounds and ounces do I use in a week?

7. How many times must I fill a cup which holds—— in order to fill a quart jug?

8. I bought——ounces of tea. What part of a lb. did I buy?

9. I am——years old. My brother is $\frac{1}{2}$ of my age. What age is my brother?

10. How long a time is it from——o'clock in the morning to——o'clock in the evening?

11. If I have——marbles and you have——marbles, how many must you give me that we may each have the same number?

12. A milk-can holds——quarts. How many gallons does it hold?

13. How old is a man who was born in 18——?

14. From a yard of cloth——inches were cut off. What part of the yard remained?

TEST QUESTIONS.

1. Read or write 5036279. (*a*) What is the place-value of each digit in this number? (*b*) How many places up is it? (*c*) In what period is it?

2. What is addition?

3. What is subtraction?

4. How is subtraction related to addition?

5. What is a result found by addition called?

6. What is a result found by subtraction called?

7. What do brackets indicate?

8. What kinds of numbers may be added or subtracted?

9. What is multiplication?

10. When can an example in addition be worked by multiplication?

11. What is the quantity to be multiplied called?

12. What is the number called by which we multiply?

13. What common name is given to the multiplicand and the multiplier?

14. What is the result found by multiplication called?

15. What is an abstract number? A concrete number?

16. How multiply by 10, 100, 1000? How divide?

17. What is division?

18. What is the quantity to be divided called?

19. What is the number by which we divide called?

20. What is the result found by division called?

21. What is partition? What is quotition?

22. \$12 ÷ \$4. Is this partition or quotition?

23. How is division connected with multiplication?

24. How is division connected with subtraction?

25. What is the divisor × quotient + remainder equal to?

26. How prove an example in division?

27. How prove an example in multiplication?

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